GLENCAL TECHNOLOGY

Pokka-Sapporo Co.,Ltd, in partnership with Glencal Technology Installed a RedoxMaster unit at the company's Gumma Plant in 2022 to dry and process waste Soymilk residues into a high-performance premium animal feed supplement.

The RedoxMaster® innovative and patented design uses the Mixed Ion Reactive Approach (MIRA.) The MIRA engine incorporates advanced ionization technology to generate reactive oxygen species and ultra-low energy plasma ions. This scientific approach facilitates the unprecedented rapid drying of wet materials by disrupting the hydrogen bonds in the water molecule to form smaller clusters, enabling swift drying at remarkably low temperatures, thereby delivering significant energy cost savings, reduced CO2 emissions and, most importantly, RedoxMaster dries without carbonization or oxidization, therefore preserving the original properties of organic materials.

RedoxMaster® ultra-low temperature ionisation drying method prevents oil oxidation and protein denaturation while significantly reducing carbon dioxide. Using RedoxMaster® to dry the Soymilk residues, which was previously disposed of at high costs, is now generating substantial revenue, as the dried material is rich in protein and other essential nutrients, making it an ideal and high-value premium animal feed supplement. The dried material has a moisture content of less than 10.0%, allowing easy transportation and long-term storage without risk of spoilage and further promoting sustainability in Japan's agricultural and food processing industry.

The dried material can be used as Agricultural Material, Aquafeed, Chicken feed, Animal Feed, and is currently sold as a high-value premium animal feed supplement.

Facts regarding waste Soy and Residues

- The waste from the production typically spoils and creates a rotten smell within 24 hours from the completed production run, and managing the odour causes significant operational challenges, which lead to high disposal costs
- *Waste Soy and Residues, when sent to landfill, has an enormous environmental impact, causing very bad odours and pollution of the surface and groundwater*
- *If these types of waste are allowed to decompose naturally without being treated, the methane (CH4) and carbon dioxide (CO2), both of which are greenhouse gases and considered to be very potent, will be released.*

Project Benefits and Key Outcomes

When RedoxMaster® is utilized to process waste Soymilk residues, it maximizes the sales value of the by-product and enables its positive reuse in the circular economy. The significant reduction in greenhouse gases also opens the opportunity for financial benefits through trading carbon credits. The project not only reduced the environmental burden but also completed the food recycling loop within the region, adding high value by recycling local resources that can be preserved and utilized throughout Japan's Agricultural Industry.

Before Introduction (Soy Residue)	After *RedoxMaster®* (Soy Residue)
6.0 - tonnes per day	1.2 - tonnes per day

Before Introduction (CO_2)	After *RedoxMaster®* (CO_2)
160.5 kg - per day	98.1 kg - per day

Pokka-Sapporo Co.,Ltd,

- *Reduced CO_2 by 38.9% compared against conventional Rotary Kiln dryer*
- *Reduced their carbon footprint in accordance with the organizations ESG's*
- *Reduced the OPEX for waste management and disposal fees*
- *Generated a substantial revenue model from the sale of dried materials*
- *Achieved an outstanding **Project ROI of less than 2.65 years**, with the major contributing factor achieving an **average of USD 0.50 / 1.00 per kg** sales price of the dried materials.*

Glencal Technology

Glencal Technology is extremely proud to be part of this successful partnership with Pokka-Sapporo Co., Ltd. The project has delivered results that exceeded our client's expectations, and we are excited about the prospect of continuing to serve and partner with them for many years to come.

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