



kome-kami

Paper Made with Discarded Rice Reduces Food Waste

As the staple food of the Japanese people, rice is produced throughout Japan, and many local governments and business corporations stockpile it for emergency use in times of disaster. After a certain period of time, however, the quality and flavor of the stockpiled rice deteriorate, making it unsuitable for human consumption, so in the past there was no other option but to discard it. Recently, however, a venerable paper wholesaler developed a technology that uses this unconsumable rice to make paper, a product of value.

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The company that developed “kome-kami,” the paper made with discarded rice as part of the ingredients, is Papal Co., Ltd., a venerable paper wholesaler established in 1890 in Nara Prefecture. It used rice stockpiled for disasters that corporations and municipalities were planning to discard and rice that could not be sold due to unavoidable circumstances such as packaging damage in transit. Papal added this rice to pulp, creating a paper product that was launched on the market in March 2021.

One of the reasons for the development of this product was an aspiration to cooperate with the activities of food banks. A food bank is an entity that accepts from companies and other entities donations of food products that are safe to eat but cannot be put into circulation due to damaged

packaging, overstocking, misprinting, or other reasons, and provides them free of charge to facilities, organizations, and households in need. Food banks are active in various countries around the world. In Japan, several organizations launched activities at the beginning of this century.

In these circumstances, Yamashita Yu, Associate Professor at Shiga University and food bank advisor, and Yada Kazuya, a director of Papal, met in 2020. Through Professor Yamashita, Yada learned about the current situation of food waste and the activities of food banks, and began thinking whether his company could develop products that would help resolve this issue. Eventually, he came up with the idea of using rice that would otherwise be discarded to make paper. In Japan, rice has been used as an ingredient in paper making since ancient times because it could improve the coloring and elimi-



Foil stamping emphasizes the natural texture and luxurious feel of kome-kami BOX.



Foil stamped kome-kami BOX



Mixing pulp, an intermediate material for paper, with discarded rice



The smooth curves and surfaces of kome-kami BOX are finished by applying pressure at high temperatures,

nate blotches in *ukiyo-e*¹ woodblock prints. As time passed, however, rice was replaced by chemicals that performed the same function, and the technology died out. Therefore, the company had to approach the development of paper made using rice as a new challenge, starting work from scratch. It was a continuous process of trial and error. Starchy rice is highly viscous, so the pulp stuck to the paper machine, making it difficult to handle as intended. It was also difficult to achieve uniform thickness, and the paper sometimes had holes in it.

It took the developers of Papal more than a year to overcome these difficulties, and in March 2021 they successfully commercialized “kome-kami.” After further technological improvements, in May 2023, the company developed a new product with a seamless smooth surface called “kome-kami BOX.” It is distinguished by the rich feel inherent to paper itself and a soft, supple texture derived from rice. The natural white color of the box is reminiscent of glossy rice and provides a beautiful background that brings out the characteristics of the items placed inside it. The company calls these products “food-waste paper,” expressing its wish to eliminate food waste directly and also to support initiatives to eliminate food waste by converting the cost of disposal into value. One percent of all kome-kami sales are returned in the form of donations to food banks. Papal’s idea is to use kome-kami to promote the ancient Japanese spirit of “mottainai” (a term that conveys a sense of regret over waste), thereby encouraging people to change their

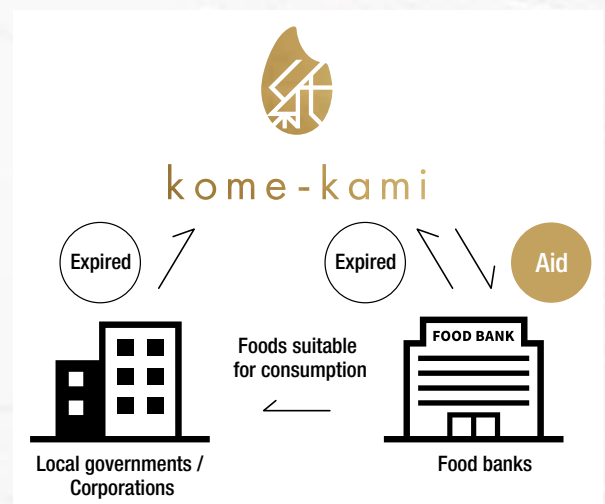
individual behavior, and aiming to further reduce food waste. Companies that share this mentality use kome-kami for packaging, business cards, pamphlets, etc. Through their efforts, the applications of kome-kami keep expanding.

This is a shift from recycling to upcycling. A material that otherwise would have been discarded is processed, has its design properties and practical applicability improved, and eventually is transformed into a new product. Another advantage of this process is that, by utilizing as much of the available material as possible and converting it into a new product, upcycling has lower energy consumption and lower environmental impact compared to conventional recycling.

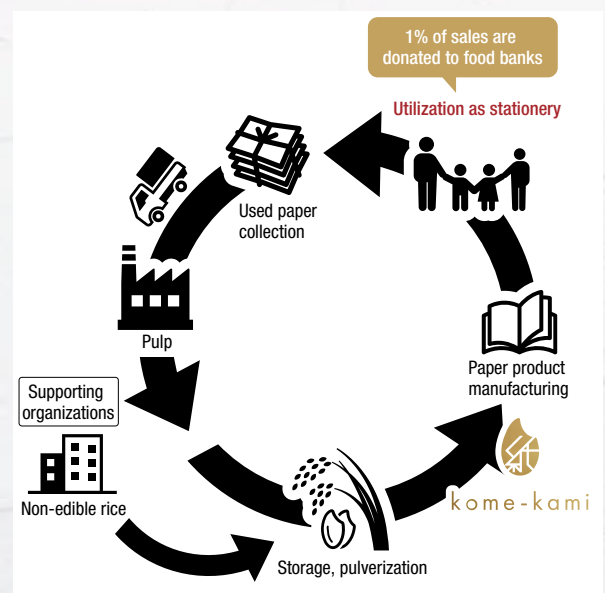
Papal’s challenging attempt with this paper has expanded to include ingredients other than rice, and the company has come up with new products such as “craft beer paper,” a type of craft paper made from malt lees discarded during the brewing of craft beer, and “vegi-kami car-

rot,” a paper material made using carrot peels. The company’s efforts continue under the concept of “converting all waste into products of value.”

¹ A style of Japanese picture art which flourished from the 17th through the 19th century. The main form of expression is woodprint.



Support for food banks provided by kome-kami



How kome-kami supports a recycling-oriented society