Program Director Interview

PD Interview

12 Leading Experts Who Accelerate SIP

Connect Food Supply Chains with Data for Sustainability

KOBAYASHI Noriaki

Kirin Holdings Co. Ltd.
Director of the Board, Senior Executive Officer
Member of the Government's Bioeconomy Strategy Council

Regrow Japan's agriculture and contribute to the world

Global distribution has been disrupted due to the impact of the COVID-19 pandemic; the issues surrounding the food supply chain in Japan are increasing, such as the decrease in the number of farmers, expansion of fallow land, and increasing food loss and waste. Amid such circumstances, it is important to create an environment that shifts to a consistent and circular economy from development to production, consumption and resource circulation to raise food sustainability. We interviewed PD KOBAYASHI Noriaki to hear about this program and the system to cover everything from basic research to social implementation.

Taking the entire value chain into consideration from a bird's-eye view

Q: Could you tell us briefly about the Japanese "Food" industry's challenges and activities to resolve them?

PD: Although the number of younger people applying for agricultural work is increasing, there are few farmers as a whole, and the population is aging. The challenges are widespread such as fallow land is expanding while food loss and waste are increasing. We cannot deal with them just by solving agriculture production problems amid the danger of food sustainability including vulnerability of the global distribution system. Therefore, we need to aim at re-growing agriculture and consider the entire value chain such as development, production, processing and distribution, sales and consumption and resource circulation (recycling) from a bird's-eye view.

The most important thing among them is data utilization; however, it cannot be said that data is linked throughout the entire supply chain. In order to address such issue, we are promoting "Construction of data/information usage/utilization infrastructure" and working on "Individual development technology deployment" that are individually required to enhance its effectiveness.

Link broad data items using JAS certification for distribution and blockchain

Q: Could you please tell us what "WAGRI-DEV" is like?

PD: First of all, "WAGRI" is an agricultural platform created during the first period of SIP that allows publicly available data such as land-related data and meteorological data mainly related to agricultural production to be used freely in one stop. "WAGRI-DEV" made in the second period of SIP connects such data to processing/distribution, and sales/consumption in the supply chain. Specifically, by using data such as daily weather, soil temperature, and growing status observed by drones, etc., to improve accuracy of harvesting and shipping time of agricultural products, and by connecting it to distribution and storage conditions such as temperature after shipping, we will make it possible to get all the information on quality from the production site to the sales site in one go.

For example, the most important thing for lettuce picked in the morning is to keep the temperature low for delivery. We made it possible to link the mechanism and the standard for guaranteeing it. At supermarkets under verification tests, we have also introduced a mechanism that allows consumers to view temperature data during distribution by scanning the QR code in the store.

In addition to production standards such as General JAS and Organic JAS, a new "distribution food chain JAS (tentative name)" may be considered. If the distribution data can be guaranteed, the consumers can feel more secure and safer, and the seller can reflect the value in the price.

Q: How is the status of social implementation, which has been progressing at full scale since last year?

PD: We have begun demonstrating the five initiatives of "Food chain information disclosure JAS," "Export promotion

utilizing tamper-proof function," "Efficiency through joint logistics and utilization of retail data," "Reduction of food loss and waste by demand forecast," and "Food loss and waste reduction by precision shipment forecast."

For example, in "Export promotion utilizing tamper-proof function", we are studying a mechanism that can guarantee and trace quality data from production to distribution, using blockchain for information on high-quality Japanese agricultural products for export. In addition, we believe that "demand forecasting" can provide real market information such as market conditions, sales trends, and price fluctuations in a form that can be utilized in the management strategy of production sites. In the future, we will have them actually used while undertaking demonstrations.

Microbiome to discover minor physical and psychological complaints

Q: You are also working on the microbiome. Could you tell us what the microbiome is and what you are working on in SIP?

PD: We focus on the relationship between intestinal microbiota and food in the microbiome research. In addition to previously studied relationships with cancer and atopy, the intestinal microbiota has recently been studied for its relationship with various diseases such as depression and dementia.

SIP focuses on intestinal microbiota and health, especially the areas of minor and pre-illness that cannot be clearly diagnosed as an illness, including presenteeism, and collects data using new methods. On the other hand, weight control is very popular in the health market, because there is a scale. In short, because you can measure it, you can immediately see the result of what you have done and make the PDCA cycle work by yourself. It is important to be able to measure the improvement of the complaint first, and as a result of understanding the minor complaint, I think that it will be possible to undertake trial and error testing on how to improve the diet and contribute to the extension of healthy life expectancy.

In addition, the feature of this program is that these data will be made public after completion of SIP. It is assumed that a shared database will be built and widely used.

Q: Could you tell us about your research and development of data-driven breeding and genome editing, and your efforts for public acceptance toward application of these technologies?

PD: Data-driven breeding uses crop genomic information and data accumulated through previous breeding. If you know the genomic information, you can predict traits such as sweetness and size, and the breeding can be registered significantly sooner than conventional ones that usually takes 15 to 20 years. It cannot be said unconditionally because it depends on the type of crop, but there is a case where the average fruit weight of strawberries was doubled in the second generation.

Regarding public acceptance, we have established a consortium, "latest breeding network," and are working to provide accurate information. In addition, I am currently giving on-site training for high school and university students, and I feel there has been a good response from that.

Connecting local foods with a smart food system

Q: Could you tell us about new challenges and future prospects amid the COVID-19 pandemic?

PD: In this COVID-19 pandemic, we are seeing vulnerabilities in the global supply chain. In some countries, grain shipments were temporarily suspended, and there are still not enough containers. Global logistics may suddenly stop, and the issue of what to do with food in that case matches our efforts, and I feel that the significance of our project has become clear again.

I think that data linkage has a very high affinity with a smart city. For example, although COVID-19 has left us with a surplus of luxury foods, the number of children who are relatively poor is increasing. It may be possible to eliminate the uneven distribution of these foods by connecting them with data. The cost issue may also be solved by using data and information. It is not possible to immediately apply a smart food system across the country, but I think it is possible to circulate foods that are unevenly distributed within a specific area in this way.

I think that if we can comprehensively design local agriculture, it will develop further. By connecting data and information and working across fields within the region while leveraging the characteristics of the region, we should be able to comprehensively design a food cycle that starts with agriculture for the entire region. Some cities are working on smart city initiative with themes such as energy and education. There is also an urban OS created in the first period of SIP, so we would like to consider an architecture that can also be accessed by "food".