

# A Study of International Markets with a Focus on Food Security (conducted as part of a larger research theme titled "Food Security in the Post-COVID-19 Era," under the Collaborative Research Scheme)

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## 1. Introduction

In the 21st century, Japan's socio-economic landscape is undergoing rapid transformation, driven by factors such as demographic shifts (including an aging population and declining birth rates), advancements in information and communication technology, diversification of values, and complex international dynamics. In response to these changes, the Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries (PRIMAFF) established a Research with collaboration scheme in FY2020, the purpose of which was to conduct research in collaboration with universities and other research institutions. A total of nine research projects were initiated under this scheme: six in FY2020, two in FY2021, and one in FY2022. One of these projects, titled "A Study of International Markets with a Focus on Food Security," was undertaken over a three-year period spanning from FY2020 to FY2022.

In recent years, the international market environment surrounding Japan's agriculture and food sector has undergone significant changes. These changes have been driven by a range of factors, including increasing global demand for grains and oilseeds such as corn and soybeans (hereinafter referred to as "grains") due to population growth, the effects of climate change, constraints on water and land resources, regional trade developments such as the TPP11 and FTA, and concerns about maintaining food supply networks in the wake of the COVID-19 pandemic, which began in 2020. In this context, Japan, which heavily relies on imports for its supply of feed grains and raw materials for vegetable oil, may face challenges in securing these commodities on international markets due to competition from emerging economies such as China. In the current study, we focused on Japan's grain value chain with respect to imports, and sought to gain a detailed understanding of the realities at each stage of the chain. The aim of this research is to provide primary data that will contribute to efforts aimed at ensuring food security for Japan.

In the present collaborative study, the PRIMAFF examined the structure of the grain industry in Brazil and other southern South American countries, which are significant grain supply regions for Japan. This study also investigated the trends of Japanese trading companies entering the region and the current state of Japan's vegetable oil manufacturing industry – a major consumer of grain. In the meantime, our partners in this research, Tokyo University of Agriculture, Kyushu University, and Ritsumeikan University, analyzed trends in the grain industry in the United States and Canada, Japan's primary grain procurement regions, in light of global food supply and demand trends. Furthermore, the study provided an analysis of the grain-related situation in China, which has a considerable impact on Japan's grain procurement, as well as on Japan's grain consumers, such as compound feed manufacturers, livestock producers, and consumers of livestock products. The grains analyzed were limited to corn, soybeans, and rapeseed.

## 2. Collaboration format

At the outset of the project, the PRIMAFF, Tokyo University of Agriculture, Kyushu University, and Ritsumeikan University faced constraints in conducting overseas research due to the COVID-19 pandemic. However, they were able to continue the research by holding online video conferences. Furthermore, the findings obtained through this research were shared in a timely manner with the Ministry of Agriculture, Forestry and Fisheries, Minister's Secretariat, Policy Planning Division, Food Security Office (MAFF).

In addition to the above, we have undertaken the following three steps to disseminate our research findings. The first step was presenting at academic conferences. In March 2022, we held a special session at the 2022 Annual Meeting of the Japanese Society of Agricultural Economics, titled "Tight Supply and Demand of Grains and Vertical Chains in Japan's Grain Value Chain." The topics presented at this session included "Analysis of Factors Affecting Corn Supply-Demand Fluctuations in China," "Business Strategies of General Trading Companies in the Brazilian Grain Value Chain: Perspectives from the Brazilian Grain Collection Industry in the Latter Half of the 2010s," "Trends in Canadian Grain and Oilseed Exports and Prospects for Production, Processing, and Exports," "Structural Analysis of the US-Japan Feed Grain and Compound Feed Value Chain," "Environmental Changes Surrounding the Vegetable Oil Manufacturing Industry and Acquisition of Competitive Advantage: From the Perspective of Strategic Management Theory," and "Analysis of Actual Livestock Management and Feed Use."

The second step was the establishment of a collaborative course. By utilizing the framework of special lectures for students at Tokyo University of Agriculture, we implemented a course titled "Introduction to Food Security and Global Value Chains" in the second semester of the academic year of 2022, where students learned about Japan's food security policies, trends in food

supply and demand, and corporate trends among trading companies, in addition to other topics. Approximately 200 students attended the course.

The third step was the publication of a specialized book containing our research results to date, which will be discussed in detail in the following section.

### 3. Overview of our book titled “The Structure of Grain and Oilseed Value Chains and Food Security in Japan: The Outlook for the 2020s”

In February 2023, “The Structure of Grain and Oilseed Value Chains and Food Security in Japan: The Outlook for the 2020s” was published by Agriculture and Forestry Statistics Publishing Inc. (edited by Hayashi M., Noguchi T., Yagi K., and Hotta K.). This book aims to comprehensively assess the state and challenges of Japan’s grain value chain, extending from the grain industry in the Americas to grain consumers and other stakeholders in Japan, with a focus on ensuring Japan’s food security. When the behavior of various actors at different stages of the grain value chain changes due to alterations in the external environment and other factors, there are corresponding shifts in both the qualitative and quantitative demand for grain. These changes, in turn, have a ripple effect throughout the entire grain value chain. This book provides a comprehensive analysis of the grain value chain in Japan. It encompasses not only the horizontal relationships among various actors within the value chain, but also offers an overarching perspective that includes an examination of the interrelationships across different vertical stages.

In Part I of this book, titled “An Overview of the International Markets Surrounding Japan’s Grain Value Chain,” the structure of the global trade in corn and soybeans is analyzed. Furthermore, there is an examination of the supply and demand of corn in China, which is the world’s largest consumer of grain, as well as its impact. The structure and behavior of companies in the grain industries in the United States, Canada, and Brazil, which are Japan’s primary import partners for grains such as corn, soybeans, and rapeseed, are also discussed.

In Part II, titled “Aspects of the Actors Comprising the Grain Value Chain in Japan,” the business strategies of Japanese trading companies responsible for procuring grain from overseas are examined. Added to this is a detailed discussion of the vegetable oil manufacturing industry, which is the primary destination for imported soybeans and rapeseed. Furthermore, this section includes the analysis of the industrial structure and the behavior of companies in the compound feed manufacturing industry, which uses imported corn as well as the soybean and rapeseed meals – the latter being the byproducts of the vegetable oil refining process. In addition, this section discusses the livestock industry, which relies on compound feed, and examines the effects of soaring grain prices on dairy, beef cattle, and poultry farming, all of which have a high utilization rate for concentrate feed made from grains. Moreover, consumers’ attitudes toward the use of feed for livestock are analyzed in order to forecast future demand for grains.

In light of these competitive relationships at each stage of the value chain, companies are adopting survival strategies such as forming alliances and streamlining management. However, given the recent surge in grain prices and other factors, it is anticipated that individual company efforts may not suffice. Therefore, it is necessary for the industries to address these challenges collectively, and explore inter-company collaboration to enhance industrial competitiveness and the optimization of the entire value chain.

### 4. Summary

In 2022, the MAFF established an internal review team on food security to identify potential risks that could impact the stable supply of Japanese agricultural, forestry, fishery products and food. A comprehensive analysis and evaluation of the risks and their effects was conducted. Seven risk scenarios were considered, including trade risks, price risks, and logistics risks such as disruptions to transportation and port infrastructure, as well as the spread of infectious diseases in light of the COVID-19 pandemic.

In this study, we adopted a value chain perspective that encompasses production, processing, and sales. We believe that this approach will be valuable in identifying where the risks may arise and understanding how their impact will spread.

The scope of this research is limited to the soybean, corn, and rapeseed value chains in Japan and the Americas. However, future work will include diversifying the commodities analyzed, expanding the focus to include demand trends in emerging Asian countries that are expected to impact Japan’s procurement, and analyzing the role of the state in market regulation.

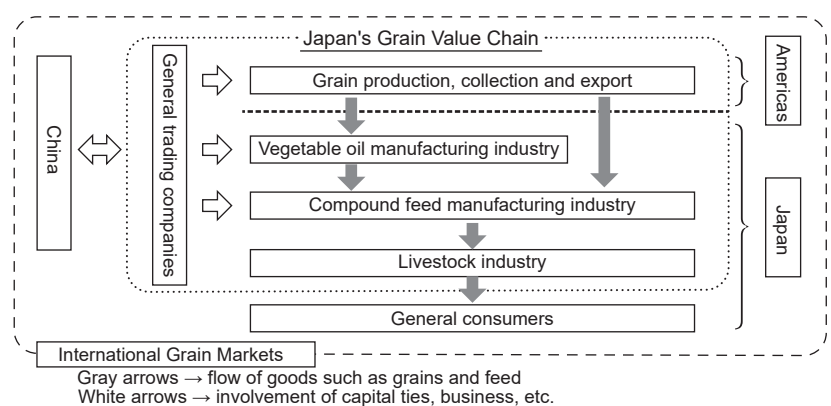


Figure 1. The Object of Analysis in “The Structure of Grain and Oilseed Value Chains and Food Security in Japan: The Outlook for the 2020s”

Source: Prepared by the authors