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主論文の要約

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学 位 論 文 題 目

Towards implementation of traceability for shrimp supply chain in Vietnam: economic analysis and global trade potential consideration

(ベトナムにおけるエビ供給連鎖へのトレーサビリティ導入に向けて
:経済分析と国際的貿易潜在力の考察)

Background and Objectives

Shrimp products play a vital role in the international trade of fisheries products. The main suppliers for shrimp products are Vietnam, Thailand, Bangladesh and other countries in Southeast Asia. Vietnamese shrimp products are mostly produced to export to global markets. The US, EU and Japan markets are the major importers, accounting 50% of total Vietnamese shrimp exported value.

As other fisheries products, the importing countries have issued the policies and regulations for specific requirements of traceability to devote the mandatory requirements for the compliance of, both domestic and imported shrimp producers. The specification of those regulations and practices in importing countries requests the responses of shrimp exporting countries to comply with those stringent requirements. Various approaches for implementation of traceability are applied policies and regulations at the major shrimp exporting countries, including Thailand, Vietnam and other Southeast Asia countries to access to international markets. However, the implementation of those policies and regulations in exporting countries are facing to the challenges due to the limitation of incentive economic benefit.

This study aims to (1) investigate the costs and benefits of traceability implementation for shrimp producers in exporting countries based on the economical examinations and (2) discuss the alternatives to enhance the implementation of traceability for shrimp products in exporting countries to meet the requirements from importing countries and consumer's needs. Our focus is on Vietnam, where the Mekong Delta accounts for only 12% of the country's geography, but plays a vital aquaculture role with 70% of total production and 60% of total export value of Vietnamese shrimp products.

Materials and Methods

Data collection To achieve the study's purposes, an overview of the traceability implementation for shrimp products in global markets was conducted based on the previous scholars and the specific policies and regulations. On the other hand, the interview survey was conducted in Mekong Delta, Vietnam, which covered all stages of shrimp supply chain, including shrimp farmers, middlemen (e.g. collectors, brokers/traders and other wholesale agents) and processors, from June to July 2017. Besides that, the information about the background of shrimp production and traceability implementation in Mekong Delta and the whole country was obtained based on the annual reports of Provincial Department of Fisheries and Provincial Department of Agriculture, Fisheries and Forestry Quality Assurances in Mekong Delta, Vietnam.

Data analysis To examine the economic implication of traceability implementation for shrimp products, the comparison of the distribution channels and movement of information along shrimp supply chain in terms of traceability, firstly, were conducted to identify the changes in supply chain of shrimp products in terms of traceability in Mekong Delta, Vietnam. Costs-benefits analysis (CBAs), then, was applied to investigate the economic influencing of traceability implementation to

shrimp producers along supply chain.

The alternatives for implementation of traceability along the shrimp supply chain were discussed in several steps as follows:

- ✓ Investigate the willingness to implement (WTI) traceability, and the expected price of farmers for shrimp products based on the double bound choices question.
- ✓ Estimate the factors influencing to the expected price of shrimp farmers for shrimp products with traceability based on the Censored Regression Model (CRM).
- ✓ Investigate the maximum farm-gate price of the shrimp farming input's buyers.
- ✓ Discuss the alternatives of traceability implementation based on the experimental results from the current study.

Results and Discussion

The overview's results about traceability implementation in global markets indicated that, traceability was implemented for shrimp products under various forms. The main purposes of the implementation of traceability were to identify from whom to whom the products had been supplied for enhancing the food quality and safety. Differences countries might have the differences considerations to the traceability implementation and requirements. In global markets, the implementation of traceability in importing countries was applied for both domestic products and imported products. Therefore, to meet those requirements of importing countries, the implementation of traceability in shrimp exporting countries must be considered to access to the global markets.

The results from interview survey indicated that, 100% shrimp products in the samples, which were applied quality assurances certificates, were directly distributed from farmers to processors. While as 97.5% non-certified shrimp products in the samples were provided to shrimp processors through middlemen and the rest of 2.5% non-certified products were directly provided to shrimp processors under the contracted agreement. The movement of information along shrimp supply chain in Mekong Delta, Vietnam were depended on the distribution flows from shrimp farms to processors. The application of quality assurances for shrimp products at shrimp farmers might enhance the implementation of traceability towards to satisfy the requirements of global markets.

In current study, the CBAs approaches could not confirm the benefits of traceability implementation for shrimp producers. The main reasons were indicated because the less of the farm gate price paid for shrimp products with traceability implementation, comparing to the farm gate price of shrimp products without traceability. Based on the CBAs results, the farm-gate price for shrimp products were suggested at 10.17 USD per kg (*P. monodon* shrimp) and 6.35 USD per kg (*L. vannamei* shrimp) to balance the costs and benefits as well as to enhance the implementation of traceability.

The expected farm-gate price of shrimp farmers and the maximum farm-gate paid for shrimp products with traceability of shrimp farming input buyers were examined based on the conducted information from interview survey. The found results indicated that, shrimp farmers expected the farm-gate price for shrimp products in order to implement traceability at 10.17 USD per kg (*P. monodon* shrimp) and 6.15 USD per kg (*L. vannamei* shrimp). The expected farm-gate price of shrimp farmers for *P. monodon* shrimp was roughly homologous to the suggested price from CBAs, while the expected farm-gate price for *L. vannamei* shrimp was concordant with the conducted price of non-traceability shrimp products from the interview survey. From the shrimp farming input buyers, the maximum farm-gate price of shrimp products might be at 10.26 USD per kg (*P. monodon* shrimp) and 6.18 USD per kg (*L. vannamei* shrimp). Thus, the shrimp farming inputs might be paid a higher price to enhance the implementation of traceability. On the other hand, the application of quality assurances certificates were found as the important alternatives for the implementation of traceability along shrimp supply chain towards to meet the requirements of global markets. Towards the global markets, the traceability for shrimp products was suggested to perform with the integration to the application of quality assurances certificates.