

# 수산식품산업 푸드테크 환경분석 및 적용전략 연구

A Study on Food Tech Environment and  
Application Strategy in the Seafood Industry

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# EXECUTIVE SUMMARY

## 1. Purpose

- The seafood industry is evaluated as a future growth engine industry thanks to increasing income resulting from economic growth and the preference to processing food which highlights health, function and convenience.
- Despite a growing global demand for seafood, fishery resources for production are limited, bringing the global issue of fishery resource depletion to the fore. Therefore, establishing production systems has become necessary to respond to increasing demand.
- Under these circumstances of sharply changing domestic and foreign conditions surrounding the seafood industry specifically due to COVID-19, a new production paradigm for seafood production is necessary to respond to issues including national food security, protection of marine resources and marine environments, and carbon neutrality.

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- As an alternative to counter to future food crisis and protect the environment and resources, Food Tech has gained attention, a concept that combines food and technology.
  - This study aims to examine the present status and cases of Food Tech applied in the seafood industry, while suggesting development measures and policy tasks to expand its application to the seafood industry in Korea.

## **2. Methodology and Features**

### **1) Methodology**

- A number of methods were utilized in this study such as review of preceding studies, analysis of statistical data, request of a manuscript to experts, consumer survey, in-depth interviews and keyword analysis.
- First, preceding studies were reviewed with regard to the definition of the Food Tech industry, trend and cases of the Food Tech market, methodologies such as keyword analysis and consumer acceptance analysis and relevant policies as well as systems.
- Together with consultations with experts to identify the definition of seafood Food Tech, domestic and foreign technological level and R&D status, an academic conference

was held and participated by the academic circle, research institutes and food businesses, seeking development measures for seafood Food Tech.

- Targeting Food Tech businesses, this study conducted an in-depth interview to understand accurate status of the Food Tech industry in Korea's seafood sector. The study also reviewed laws under the jurisdiction of the Ministry of Oceans and Fisheries as well as domestic and foreign relevant laws for legal and institutional rearrangement to invigorate the Food Tech industry.
- To be specific, consumer acceptability was evaluated on seafood-based Food Tech products by conducting a survey on awareness and acceptance of alternative meat and cultured meat targeting 600 domestic consumers.
- Lastly, basic directions and specific tasks were extracted to invigorate the seafood Food Tech industry through consultations on the demand with experts in industry, governments, academia and research institutes as well as discussions with those in charge of policy for connecting with relevant policies.

## **2) Features**

- With an increasing interest towards Food Tech, a number of various studies have been conducted. However, this study

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differentiates itself from other studies by primarily focusing on seafood, rather than covering agriculture or livestock products.

- The seafood Food Tech market is at an initial stage of forming; hence, this study bears its significance in that it utilized keyword analysis to extract specific keywords, visualizing the market which has been otherwise.
- By conducting a consumer acceptance analysis on seafood Food Tech products, this study deduced consumers' willingness-to-pay, offering information that businesses able to use for commercialization.
- As the study utilized consultations with experts in relevant industries, governments, academia and research institutes on demand as well as discussions with those in charge of policy for connecting with relevant policies, this study was able to extract specific action plans applicable to actual policies to invigorate the seafood Food Tech industry

### **3. Results**

#### **1) Summary**

- This study aims to present specific policies to invigorate Food Tech in the seafood industry with an intention to stably secure seafood for the future. Such effort is significant as

a response to depleting fishery resources and food crisis etc. under the circumstance of increasing global demand of seafood.

- The global Food Tech market is evaluated as a promising industry as the market is expected to grow from 4.6 billion dollars in 2019 to 7.8 billion dollars with an annual growth rate of 9.2%.
- As the Food Tech market has not yet formed in the seafood industry in particular, this study utilized keyword analysis to extract characteristics and trend in the seafood Food Tech industry.
  - According to the results of keyword analysis, seaweed has gained major attention pertaining to the development of alternative meat, while protein bars are considered a major alternative product for turning seaweed into food products.
  - With regard to cultured meat, interest to health was extracted as the closest associated word. If the safety of cultured meat is secured and the nutritional excellence of seafood is promoted, a potential niche market can be discovered.
- According to the analysis of technology and policy trends between advanced nations in Food Tech and Korea, the US, EU and Japan are among advanced nations in Food Tech with 3~5 years ahead of technological gap with Korea.
- In terms of R&D investment, advanced countries have actively attracted investment from private sector, channeling a large

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amount of investment into R&D. In Korea, however, small investments are taking place only centering on governments, which requires expanding R&D in the public sector while attracting investment from the private sector.

- Advanced nations in Food Tech already have started institutional rearrangements for commercializing Food Tech products whereas Korea needs to lay institutional foundations for distributing Food Tech products by due process of law.
- According to the analysis of domestic and foreign cases of Food Tech, successful cases commonly show features such as possession of source technology for the development of Food Tech products and diversified sales channel for selling Food Tech products.
- In order to enhance Korea's competitiveness of Food Tech in the seafood industry, developing source technology is indispensable for product development. In the process of product commercialization, it is necessary to broaden the sales network to farther into foreign markets.
- The consumer acceptance analysis on seafood-based Food Tech products showed that the willingness-to-pay for Food Tech products made of seafood is higher than that of Food Tech products made of other ingredients, representing high chance of success.
- Consumers consider information such as 'health' and 'sanitation/safety' important when purchasing Food Tech products.

Therefore, marketing activities should be conducted with the primary focus on health and food safety to invigorate the sales of products.

- A number of limitations were pointed out in Korea's seafood Food Tech industry such as a lack of source technology for product development, a shortage of finance and professional manpower to promote relevant companies, insufficient policies for industrial promotion, consumers' concerns over safety, and low awareness on Food Tech products by consumers.
- To address these issues, this study proposed four basic directions and specific strategies as follows: 'building an ecosystem for the development of the Food Tech industry', 'strengthening and promoting the capacity of Food Tech businesses', 'rearranging systems for the promotion of the Food Tech industry and formulating promotion strategies', and 'public PR for creating the Food Tech market'.

## **2) Policy suggestions and policy-making activities**

- Based on the results of this study, specific suggestions were made for the invigoration of the Food Tech industry in the seafood sector.
- First, for nurturing the seafood Food Tech industry, it is necessary to establish a comprehensive development plan at the government level based on which the industry is systematically



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promoted. Therefore, this study proposes for formulation of a task force for 'development planning of the seafood Food Techno industry' as well as operational measures.

- Second, the analysis of domestic and foreign cases of Food Tech application showed that the most important factor for success lies in the development of core technology. Hence, the study proposed the operation of Future Seafood Development project expected to implement around 2022~2024 along with directions.
- Third, securing basic statistics is essential to accurately recognize the present status of the industry. So this study suggests conducting a status survey on seafood Food Tech and establishment of basic statistics within the formulation of the Basic Plan for Seafood Industry Statistics.
- Fourth, supplying specialized manpower is a necessity for the promotion of the seafood Food Tech industry. Therefore, this study proposes a concrete project for nurturing professional manpower in Food Tech in accordance with article 6 (nurturing seafood industry specialists) within the Seafood Industry Promotion and Support Act which was legislated in 2021.
- Lastly, a number of suggestions were made to create a success model for seafood Food Tech startups such as measures to utilize existing industries, strategies to expand the investment from the private sector, safety management of Food Tech products and public PR strategies.
- A roadmap for systematic implementation of the aforementioned suggestions is shown as below

Implementation roadmap per year to invigorate the seafood Food Tech industry  
(’22-’26)

Classification	2022	2023	2024	2025	2026	Principal agents of implementation
Establish and implement development plans	Plan establishment	Plan implementation				Ministry of Oceans and Fisheries (MOF)
Develop source technology	Push forward R&D for technological development of future seafood			Connect with commercialization		Korea Institute of Maritime Science & Technology Promotion
Status survey on Food Tech companies and build statistics	Reflect statistics to the Basic Plan	Secure the budget for statistical survey	Status survey and build statistics (600 million KRW, 200 million KRW per year)			Korea Maritime Institute
Nurture Food Tech specialized manpower	Nurture professionals, Secure budget	Operate programs for nurturing Food Tech experts (4 billion KRW, 1 billion KRW per year)				Korea Fisheries Infrastructure Public Agency
Create startup success model	Support the opening of startup business (Ocean and Fisheries Startup Investment Support Center, Maritime New Industry Incubating Project)					MOF
Safety management and public PR		Prepare a guideline for safety inspection of cultured meat		Public PR		Ministry of Food and Drug Safety, MOF

### 3) Expected benefits including policy contribution

- With the combination between the seafood industry with Food Tech, this study contributes to responding to the 4th Industrial Revolution and boosting competitiveness of the fisheries industry, leading to increase income in the fisheries industry.

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- This study allows securing national competitiveness by discovering a new market of alternative meat in the global vegan consumer market, while establishing a stable seafood supply system through cultured meat production