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# An Analysis of the Egg Distribution Industry in Korea and Developed Countries in the Post COVID-19\*

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## Abstract

**Purpose:** This study aims to set desirable directions for Korea's egg industry by comparing and analyzing the egg distribution structure and policies between Korea and other countries. **Research design, data and methodology:** We analyzed the current state of egg distribution in Korea, and based on this analysis, we derived problems. In addition, by comprehensively analyzing the egg distribution structure and policy issues in the US, EU, and Japan. **Results:** As a result of the analysis of the egg distribution status and policy in the country to be analyzed, it was found that for the development of the egg industry in Korea, it is necessary to unify the distribution system for transparent and stable management of the egg distribution process. It was found that detailed and clear information creation and management of egg production and distribution processes were required. **Conclusions:** We need to establish a regional egg distribution facility base and stipulate that eggs produced in Korea must be compulsorily traded through the regional facility base. Seemingly, scaling-up of the industry is the priority, but the government is promoting various policies to expand small and medium-sized egg joint markets, with limitations in improving the problems of the existing egg distribution structure.

**Keywords:** Egg Distribution, Egg Joint Market, Egg Distribution Policy, Egg Distribution Channel

**JEL Classification Code:** N10, Q17, Q18

## 1. Introduction

In Korea, the prolonged coronavirus disease 2019 (COVID-19) pandemic and consequent changes in eating habits among the public, aggravated by the unstable egg supply owing to the killing of laying hens affected by the highly pathogenic avian influenza (AI), caused a sharp rise in the price of eggs by the end of 2021.

The disruption in the egg market due to the pandemic is observed in not only Korea but also worldwide. In Europe, the consumption of food generally increased, but the consumption of eggs decreased rapidly due to the border closure measures implemented throughout the EU. This led

to a significant glut of eggs and egg products in April 2020. In addition, egg production in major European countries showed a significant decline compared to 2015, such as Poland -12.2%, the Netherlands -12.1%, and Belgium -5.3%. In the US, the price of eggs distributed in retail stores has risen by 141% while that of eggs used in restaurants has fallen by 67% since the onset of the COVID-19 pandemic (Malone et al., 2021). In the case of Japan, which has a similar distribution structure with Korea, the price of eggs rises sharply due to the occurrence of AI in early 2021 along with the gradual recovery of consumption as the COVID-19 pandemic subsides; at 340 yen per 1 kg of eggs, it was about twice the price of the previous year. After the pandemic, the

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order for eggs received from wholesale outlets decreased during the “state of emergency” declared by the Japanese government and increased thereafter, repeatedly. Accordingly, the price of eggs has fluctuated.

Apparently, the COVID-19 pandemic had significantly affected the global egg market. In particular, Korea and Japan suffered from the instability in demand and supply due to the occurrence of AI as well as the COVID-19 outbreak, with a significant impact on egg price volatility.

Traditionally, Korea has had unfair and nontransparent egg distribution practices, including HuJangGi Trading, whereby the egg distributor pays the egg purchase price to a layer farm at a discount (D/C) for various reasons, including changes in costs and market price, thus complicating the situation for layer farms to maintain their income. Additionally, due to the persistent imbalance between supply and demand, a stable consumption environment has not been established, and this has heightened the vulnerability of the Korean egg market to the COVID-19 and AI outbreaks.

To address these structural egg distribution problems, numerous studies have been conducted in Korea. Although a study on the need for government investment in the public egg wholesale market as well as storage and processing facilities has been conducted in the past (Kim et al., 1994), most research focus on the improvement of the distribution structure, around the grading and packing (GP) centers (Jeong, 2000; Kim et al., 2017; Kim et al., 2020). In addition, a study has also emphasized the need of policies toward reducing the bargaining power between the transaction parties to address the distribution problems of the egg market (Hwang et al., 2013).

In particular, this study is judged to be differentiated from previous studies in that it analyzes the egg distribution system of each country through the laws and related policy data of the countries to be analyzed, such as the EU, the United States, and Japan.

## 2. Literature Reviews

In Korea, research on the problems and improvement of the egg distribution structure has been focused. Jeong, M. K. (2000) judged that the unfairness and instability of egg trading prices and the lack of hygiene and safety management of eggs were due to the distribution structure. In order to improve this, they expressed the opinion that reform of the distribution structure, such as activation of the GP center and opening of the egg wholesale market, is necessary. Hwang, S. O. and Park, M. S. (2013) found an asymmetric price transition between distribution stages in egg prices. This cause was judged to be due to the imbalance of bargaining power between the parties to the transaction. To solve these problems, it was suggested that a policy for

mitigating market dominance between distribution stages is needed. Kim, D. J. et al. (2017) emphasized the need to activate livestock check-off 'Livestock check-off' means a fund operated with the amount paid by livestock producers to promote the development of the livestock industry, such as improving the safety of livestock products and promoting consumption. (Act on Creation and Operation of Livestock Check-off, 2023)

for the development of the egg industry, and the need to establish a GP center-centered trading system for smooth livestock check-off to make the distribution structure transparent. Kim, Y. D. et al. (2020) analyzed the egg distribution structure between Korea and developed countries in the egg industry. In order to secure hygiene and safety of eggs, it is necessary to improve the distribution system that can serve as a base for egg distribution, such as the GP Center. However, overseas studies, including Europe and the US, have mostly analyzed the effectiveness of hen welfare, that is, cage-free breeding (Gautrona et al., 2021; Rodenburg et al., 2022; Hörisch, 2018), as well as the positive effect of the advancement of the production technologies of the egg and related industries on the environment (Pelletier et al., 2014). In addition, several analyses have been conducted on changes in the egg market and supply chain since the COVID-19 outbreak (Dermot et al., 2020; Malone et al., 2021).

**Table 1:** Key Contents of Prior Research Related to the Egg Industry

| Research                                                                    | Key contents                                                             |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Kim, J. J., & Kim, W. Y. (1994)                                             | Government investment in egg wholesale markets and processing facilities |
| Jeong, M. K. (2000)                                                         | Building an egg distribution structure centered on GP centers            |
| Kim, D. J., Hong, S. K., & Kim, Y. D. (2017)                                |                                                                          |
| Kim, Y. D., Kim, D. J., & Chae, S. H. (2020)                                |                                                                          |
| Hwang, S. O., & Park, M. S. (2013)                                          | Enhancing bargaining power between trading partners                      |
| J. Gautrona, S. Réhault-Godbert, T.G.H.Van de Braak, & I. C. Dunnc. (2021)  | Analysis of hen welfare and free-range breeding effect                   |
| T. Bas Rodenburg, Mona F. Giersberg, Paul Petersan, & Sara Shieldsc. (2022) |                                                                          |
| JacobHörisch. (2018)                                                        |                                                                          |
| Nathan P., Maro I., & Hongwei X. (2014)                                     | Analysis of the effect of development of production technology           |
| Dermot J. H., Lee L. S., Chad E. H., & Keri L. J. (2020)                    | Analysis of changes in the egg supply chain after COVID19                |

Previous studies on the egg production and distribution industry show the difference between Korea and other countries with more advanced egg industries, with the

former focused on the policy improvement of distribution structure, and so on, while the latter centers on animal welfare and environmental improvement. All countries are producing, distributing, and consuming eggs, but in this study, we tried to benchmark measures for the development of the Korean egg industry through case studies of the more advanced egg industries of the US, Japan, and EU.

### 3. Analysis of Korea's Egg Distribution Structure and Problems

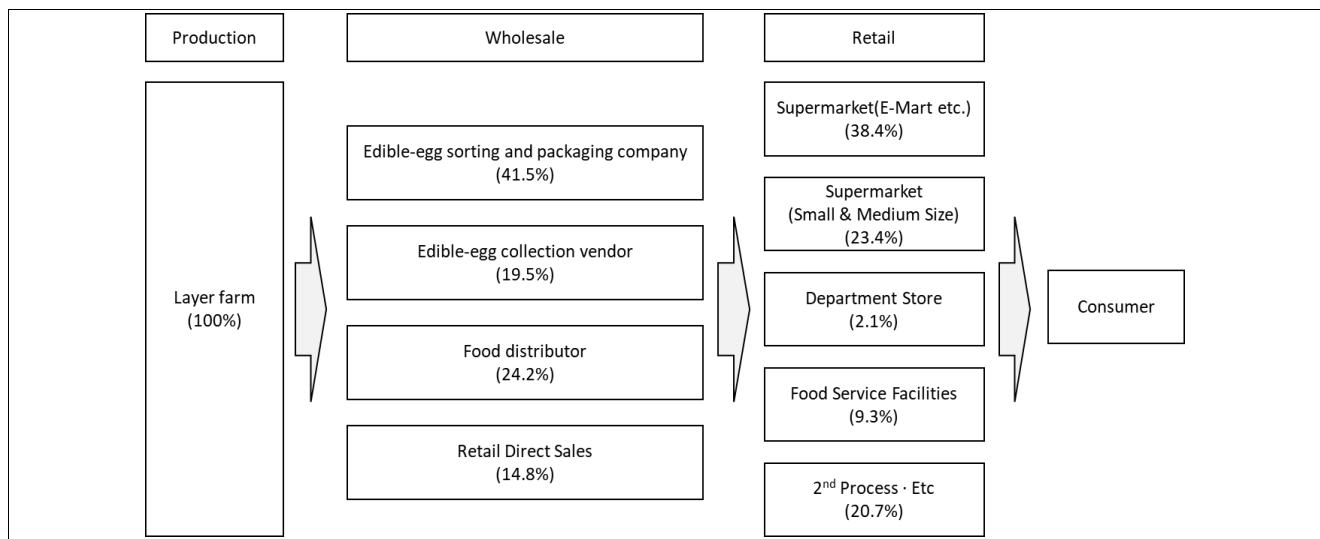
#### 3.1. Korea's Egg Distribution Structure

In Korea, most of the eggs produced in layer farms are distributed to retailers and consumers, through “edible-egg sorting and packaging companies,” “edible-egg collection vendors,” and “food distributors.” The roles of the distributors in the wholesale stage are as follows: an edible-egg sorting and packaging company refers to a warehouse that is approved to sort and pack edible eggs by the edible-egg collection vendor. It gathers, sorts, and packs the eggs delivered and collected from the layer farms. As of 2020, there is a total of 137 edible-egg sorting and packaging companies in Korea. Next, edible-egg collection vendors, except edible-egg sorting and packaging companies, are layer farms or wholesalers of raw/packaged eggs that sell to

retailers, secondary processing plants, sorting and packaging companies, and so on. In Korea, there are 3,003 vendors. Food distributors, which are wholesale distribution companies, distribute packaged eggs through edible-egg sorting and packaging companies as an original equipment manufacturer production for food companies and large distributors.

Regarding the proportion of distribution by stage, 85.2% of the eggs produced in layer farms are distributed to the retail stage after going through the wholesale stage, and the proportion directly distributed to retailers is 14.8%. Among the distributors at the wholesale stage, edible-egg sorting and packaging companies account for the highest proportion at 41.5%, followed by food distributors with 24.2% and edible-egg collection vendors, excluding edible-egg sorting and packaging companies, at 19.5%. In other words, edible-egg sorting and packaging companies, running at 137 sites across the country, were found to deal with 41.5% of the products, showing a significantly high concentration on a single type of distributor.

Among the various distribution channels in the retail stage, supermarkets (38.4%) accounted for the largest proportion, followed by supermarkets (23.4%) and secondary processing and others (20.7%). As eggs can be easily cooked and consumed, their domestic consumption is rather high, coupled with their availability in supermarkets or supermarkets, making them easily accessible to consumers.



Source: Korea Institute for Animal Products Quality Evaluation, 2020 Livestock Products Distribution Information Investigation Report, 2021.

**Figure 1:** Egg Distribution Channels in Korea

Recently, the Korean government has supported the opening of the “egg joint market” toward ensuring the transparency of egg prices and improving the existing, albeit unreasonable, HuJangGi trading practice. The egg joint

market, which is currently operational, is operated pursuant to the Livestock Products Sanitary Control Act, on which edible-egg sorting and packaging companies are based, and the Act on Distribution and Price Stabilization of

Agricultural and Fishery Products (SAF), which is differentiated from the past egg wholesale distributors.

The egg joint market, which has started its pilot operation in January 2022, has two locations, namely, Agricultural Corporation Haemil (hereinafter "Haemil") and Pocheon Livestock Industry Cooperative (hereinafter "Pocheon Cooperative"), and the transaction amount is approximately 1 million eggs per day. The currently operating egg joint market has two auctioneers and four intermediaries, and eggs can be traded through auctions, bids, or regular price and private sales based on the SAF Act. Furthermore, the transaction fee for eggs, traded through the egg joint market, is 2.0%, lower than the level of the general agricultural wholesale market (4.0%~7.0%).

The introduction of this new distribution channel will guarantee a higher purchase price to producers while supplying eggs at a lower price to consumers by allowing competition with other distributors to lead to the improvement of egg quality and price competition. However, owing to the transaction characteristics of the egg joint market, distribution costs increase due to transaction fees, and the transaction volume is only 4.7% of the average daily egg production. Therefore, it is difficult to use the price determined in the egg joint market as a standard price.

### **3.2. Problems of Korea's Egg Distribution Structure**

The traditional problems of the egg distribution structure of Korea were mainly found to be the lack of transparency in the pricing system and distribution structure, the opacity of information for supply and demand control, and the ambiguity of the government's egg distribution policy.

First, regarding the pricing system, eggs, unlike cattle and pigs in Korea, have limitations in forming a transparent standard price due to the absence of a wholesale market. Notably, edible-egg collection vendors, who are supplied eggs from layer farms, do not make payment at the time of purchase but afterward, applying a discount rate (D/C) in consideration of egg supply, quality deterioration, logistics costs, and seasonal consumption, in a practice known as HuJangGi trading. Consequently, layer farms find it difficult to determine the egg price clearly as well as to maintain the income of the households. Such a distribution structure practically excludes layer farms from determining the price of eggs.

Second, the egg distribution structure is overly complicated. At the place of production, layer farms and GP centers are mixed. Many layer farms are run in the form of a GP center to grade and pack the eggs. Under these circumstances, the Korean government tried to provide facilities and operating funds to activate the regional GP centers for the smooth distribution of eggs, but with no significant effect as the concept and definition of the wide-

area GP centers were vague. As shown in Figure 1, the term, "GP center" is not used even in the materials published by the Korean government. In addition, various distributors—edible-egg sorting and packaging companies, edible-egg collection vendors, and food distributors—are engaged in the wholesale stage of the eggs, and it is difficult to comprehensively manage the distribution structure of eggs, as it is directly associated with public health.

Third, the information about the production and distribution of eggs is not transparent. We compared the average daily volume of processing and producing eggs of 166 GP centers nationwide (46 GP centers with grading, 120 GP centers without grading). Consequently, it was found that the distribution channel for the daily average of approximately 20,697 thousand eggs (48.45%) was not clear (Kim et al., 2020). It is impossible to figure out how half of the eggs produced per day are distributed to consumers after being produced in layer farms. The information asymmetry makes it difficult for the producer to gain the bargaining power while negatively influencing the safety and hygiene of eggs.

Fourth, there is a problem of ambiguity in the implementation of the egg distribution policy of the Korean government. First, laying hens that are currently producing eggs are classified as livestock subject to registration of the "vertical integration in the livestock industry," which is defined in the Act on Livestock Farm Alliance Systems as the industry where "a vertical integrator supplies breeding materials, etc., such as livestock and feed to a farmer raising livestock under contract defined in subparagraph 6 to make the farmer raise livestock, and receive raised livestock or livestock products produced from such livestock from the farmer raising livestock under contract in return." In other words, the government classified the egg industry as a vertical integration in the livestock industry. However, according to the "Egg Distribution Center Support Project," implemented by the Ministry of Agriculture, Food and Rural Affairs in 2019, the government intended to support the Egg Processing Center (EPC), nurturing it as an anchor of the production and distribution of eggs. In 2021, the focus of the egg distribution policy shifted again to the egg joint market, as it was open and run in two locations. During this process, it was found that the government let the new EPC be open and run in the form of a joint market, pursuant to the SAF Act. This is based on the premise that they have been authorized as an edible-egg sorting and packaging business operator, according to the Livestock Products Sanitary Control Act, and implementing egg grading, according to the Livestock Industry Act. Summarily, the Korean government has been unclear and inconsistent in its policy directions vis-à-vis the development of the egg industry and improvement of its distributional structure, with no clear key agent regarding the distribution of eggs.

## 4. Analysis of the Egg Distribution Structure and Related Institutions of Major Countries

### 4.1. Egg Distribution Structure of Major Advanced Countries

We examined the egg distribution of the countries with more advanced egg industries and higher egg consumption, including the EU, the US, and Japan. In Korea, the eggs produced in layer farms are delivered through edible-egg collection vendors, food distributors, and egg joint market to the retail stage. Edible-egg collection vendors are divided into producer (layer farms) cum distributor and specialized distributors, both of which should get permission from the heads of the local government, pursuant to Article 22 (Business Permission) of the Livestock Products Sanitary Control Act. The egg joint markets should also get permission from the city mayor or province governor, pursuant to the SAF Act.

In Europe, “packing centers” must be specified in distributing eggs according to the Commission Regulation (EC) No 589/2008 of 23 June 2008 (laying down detailed rules for implementing Council Regulation (EC) No 1234/2007, as regards marketing standards for eggs). EU regulations make it a principle to distribute eggs via “packing centers,” which have different names by country. In Germany, it is called “Packstelle,” and divided into Farmpackstelle (Farm packing center), Betr. Sammel packstelle (Collector packing center), and Gewerbl. Groß packstelle (Commercial and large packing center). In the Netherlands, the permission is divided into “Met IKB” and “Zonder IKB,” according to whether or not the certification (IKB) of the egg quality management system has been obtained. In other words, the EU provides general guidelines based on the large framework of regulations related to egg distribution, but the operation differs by country depending on the policies and conditions of each country.

In the US, large-scale corporate farms play a central role in producing and supplying eggs. For example, Cal-Maine Foods, Inc., the supplier of 19% of US egg consumption in 2020, is a company that produces, grades, packs, markets, and distributes eggs. It produces eggs, through the hatching of chicks, breeders, and laying hens; in other words, a single company is engaged in feed manufacturing, processing, packaging, and delivery related to the egg industry, which is a vertical integration business in Korea.

There are not only several similarities in the egg distribution structure among Japan, Europe, and Korea, but also differences in the institutions and regulations between countries. The US has a different industrial structure, as a single company both produces and distributes eggs.

In Japan, produced eggs are distributed to the retail stage through the Japan Agricultural Cooperatives (JA) and egg sellers. As of 2017, the share of JA in the egg market was approximately 16%. Although it represents a slight decrease from 2013 by 5%, JA still plays a pivotal role in egg distribution in the country. The share of egg sellers increased from 2013 at 76% to 2017 at 79%. Notably, JA and egg sellers also play the role of the GP center in Japan, as a main actor in egg distribution while supporting the temporary storage and packaging of eggs, inspection of eggs, manufacturing of frozen eggs, and refrigeration. As of 2018, over 450 GP centers are in operation. Japanese egg sellers are newly classified as a business, subject to reporting through the revision of the Food Sanitation Act, and operate according to local ordinances in Japan.

Notably, a “joint market,” where eggs can be traded by auctions, uniquely typifies Korea, and there is no country where egg transaction methods are under legal or institutional regulations. In other words, advanced countries, in terms of the egg industry, are equipped with the regulatory system to guarantee the sanitation and safety of eggs in the distribution process, but the transaction of eggs in the market is left in the hands of the market.

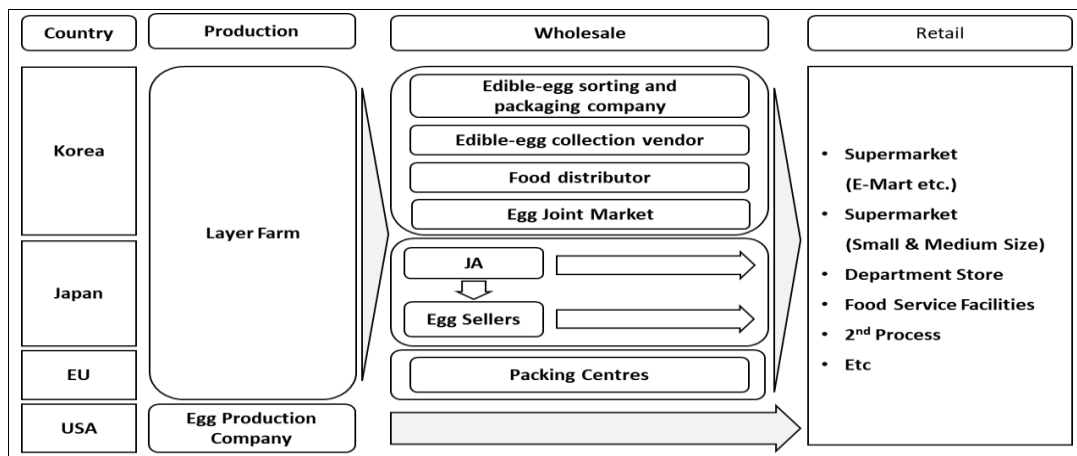


Figure 2: Egg Distribution Structure of Major Country

## 4.2. Egg Distribution System of Major Advanced Countries

The formal distributors of eggs are “edible-egg sorting and packaging companies” in Korea and “packing centers” in Europe, as well as “egg handlers” in the US and egg sellers in Japan.

The “edible-egg sorting and packaging” business in Korea can be run under the Livestock Products Sanitary Control Act, and government permission is required. Furthermore, they should comply with the regulations related to the management and sanitation of edible eggs, and the request form and ledger for the selection and packaging process must be prepared and stored for at least 2 years. Summarily, “food distributors,” except those authorized as an “edible-egg sorting and packaging business,” are not included in the formal system of egg distribution. In the case of Japan, whose distribution structure is closest to Korea’s, egg sellers are obligated to report to the prefecture according to the Food Sanitation Act, and it is mandatory to have a food sanitation manager and obtain HACCP certification. Unlike other countries, Japan has a report system, without any particular criteria for report or permission.

In Europe, there are the Council Regulation (EC) No 1234/2007 and rules to implement the standards on egg marketing at the EU level. It is specified that egg grading and packing can only be conducted in the packing centers.

Moreover, only those satisfying all the requirements would be authorized as a packing center, and they are assigned unique codes. To this end, it has been specified that packing centers should have facilities and technical equipment appropriate for grading eggs according to their quality and weight. However, the packing centers for food or non-food industries are not required to have technologies or equipment to determine the grade of eggs by weight.

In addition, it stipulates that codes should be assigned to packing centers with the initial codes of EU member states, and five technologies and equipment that they must have are

presented. If these requirements are not met, the code for the packing centers can be withdrawn any time.

However, the obligations of the packing centers are not specified, and they are up to each member country. For example, the installation of packstelle in Germany requires permission according to the EU regulations. But the roles and responsibilities of packstelle are stipulated in the regulations of Germany. In Germany, packstelle is obligated to register information related to the distribution of eggs. The information that should be registered and updated on a weekly basis includes the name and address of the egg producer; the quantity, quality, and weight of eggs; the quantity and grade; the expiration date according to grade; and the name and address of each buyer.

In the US, major distribution regulations are described in “Part 57: Inspection of Eggs (Egg Products Inspection Act)” related to egg distribution. With various regulations, the Act identifies the main distributor as “egg handler” with several regulations. As mentioned above, the US egg distribution system is around large corporate farms, without specifying the channels of distribution (actors) like edible-egg sorting and packaging businesses in Korea or packing centers in the EU, egg handler refers to those who are engaged in sales and processing of eggs and preparation of food using eggs, excluding end consumers. According to the regulations, entities that meet certain conditions among egg handlers are obligated to register with the government. All egg handlers, except the producer–packers that grade, pack, and produce less than 3,000 laying hens a year, are obligated to register with the government with business details (e.g., address). In particular, the US government should inspect them at least once a quarter and egg handlers should respond to it actively. All entities engaged in the egg business (transporting, shipping, or receiving any eggs in commerce, or holding such articles so received) should hold the records of delivery, sales, transportation, and disposition for two years. In addition, egg handlers should manage sales certificates, inventory, and receipts that can confirm the sender and recipient, as well as create and keep records that can clearly confirm the transaction date, egg quality, quantity, and so on.

**Table 2:** Egg distributor and regulations in target countries

| Country | Division                | Descriptions                                                                                                                                                                                                           |
|---------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Korea   | Egg distributing entity | ○ Edible-egg sorting and packaging business                                                                                                                                                                            |
|         | Applicable act          | ○ Livestock Products Sanitary Control Act                                                                                                                                                                              |
|         | Major regulations       | ○ Government permission<br>○ Regulations on edible egg management<br>○ Keeping the request form and ledger for the selection and packaging process (2 years)<br>○ Sanitary regulations                                 |
| Europe  | Egg distributing entity | ○ Packing center                                                                                                                                                                                                       |
|         | Applicable act          | ○ Laying down detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards marketing standards for eggs                                                                                             |
|         | Major regulations       | ○ Egg grading and packaging only available through packing centers<br>○ Facilities and technical equipment required by the packing center<br>○ Obligations of the packing center: differences between EU member states |

| Country | Division                | Descriptions                                                                                                                                                                              |
|---------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                         | - Germany: obligation to record and manage information on egg distribution                                                                                                                |
| USA     | Egg distributing entity | o Egg handler                                                                                                                                                                             |
|         | Applicable act          | o Part 57: Inspection of eggs (Egg Products Inspection Act)                                                                                                                               |
|         | Major regulations       | o Egg handlers satisfying a set of conditions should register with the government.<br>o Quarterly government inspection<br>o Create & hold the records of the entire distribution of eggs |
| Japan   | Egg distributing entity | o egg sellers                                                                                                                                                                             |
|         | Applicable act          | o Food Sanitation Act                                                                                                                                                                     |
|         | Major regulations       | o report to prefecture<br>o food sanitation officer<br>o HACCP                                                                                                                            |

Source: Ministry of Legislation, Livestock Products Sanitary Control Act, 2022.

EU, laying down detailed rules for implementing Council Regulation (EC) No 1234/2007 as regards marketing standards for eggs, 2022.

Code of Federal Regulations, Part 57: Inspection of eggs (Egg Products Inspection Act), 2022.

E-GOV, Food Sanitation Act, 2022.

## 5. Result and Conclusions

In this study, we examine the current state of the egg distribution structure and its attendant problems to enhance competitiveness and develop Korea's egg industry. We also analyze the problems of the egg joint market, recently supported by the government as a new distribution channel of eggs. Furthermore, we examine the egg distribution of the countries with more advanced egg industries and higher egg consumption rates, including the EU, the US, and Japan, and we analyze the related systems to suggest solutions to improve the problems associated with the egg distribution structure of Korea.

Owing to the nontransparent distribution structure and unreasonable practice of determining prices, damage to layer farms and consumers is accumulating in Korea's egg industry. In particular, the existing egg distribution structure was quite complicated, but the distribution channel was simply expanded without restructuring the distribution entities as the government encouraged the trading of eggs through the egg joint market from 2020. Unfortunately, the measure has made the distribution structure even more complicated.

Consequently, Korea's egg distribution structure is extremely complicated with increasing distribution channels along with the government policy of promoting egg trading through the egg joint market. Although it is introduced to achieve the transparency of egg price and formation of standard prices, the trading in the egg joint market can guarantee the transparency of egg price, as it is under regulation of the SAF Act, but raises a concern over reducing the autonomy of the market transaction. Moreover, considering the trading scale of the egg joint market, it will have limitations in playing a central role in the current egg distribution structure, and there is a risk of causing confusion in egg distribution.

In this study, we comprehensively examine the distribution structure and related systems in Japan, Europe,

and the US, and it seems necessary to introduce the distribution system and related institutions of the advanced countries for the development of the Korean egg industry. First, along with transparency in the distribution structure of eggs, it is necessary to unify the distribution system for the stable management of the government. In Europe, there are the Council Regulation (EC) No 1234/2007 and rules to implement the standards on egg marketing at the EU level. It is specified in Article 5 of the rules that egg grading and packing can only be conducted in packing centers. To be authorized as a packing center, the candidates should have facilities and capabilities above a certain level. In other words, it is safe to say that the distribution channels are unified in Europe as packing centers. In Korea, wholesale distributors are pluralized as edible-egg sorting and packaging companies, edible-egg collection vendors, food distributors, and egg joint market, thereby posing obstacles to the management of egg distribution. Thus, it is necessary to unify the existing system. To do this, securing a regional egg distribution facility base and stipulating that eggs produced in Korea must be compulsorily traded through the regional facility base are required.

Considering the cases of the US and Europe, it seems urgent to create and manage detailed and clear information on the production and distribution of eggs. According to EU regulations, the same standards for the registration of packing centers are applied to the member countries, with slight differences in information registration obligations among countries. But in general, information about the production and distribution of eggs is created, published, and updated on a regular basis. In the US, egg handlers and all entities engaged in the transaction and dealing of eggs except the end consumers, are obligated to create records of production and distribution and keep them for the minimum of two years.

In Korea, there are no clear statistics on the egg industry, including the information about the amount of distribution

compared to that of production. Therefore, a unified information collection and storage system should be established from the production stage to the distribution and consumption stages. This will not be possible without scaling up the production and distribution of eggs. The current system, centered around small-scale farms, will make it costly to collect and store information, thus burdening the operation.

As discussed earlier, mandatory egg trading through wide-area egg distribution facilities will make it easier to collect and store information and positively influence the improvement of the sanitation and safety of the eggs.

Lastly, Japan has no separate standards for facilities after the introduction of the reporting system for egg sellers; a food sanitation officer should be placed and compliance with the HACCP standards is mandatory. Korea should also establish a regulation system at the government level for egg distribution entities, including edible-egg sorting and selling companies, to guarantee the sanitation and safety of eggs.

To develop Korea's egg industry, first, we need to establish a regional egg distribution facility base and stipulate that eggs produced in Korea must be compulsorily traded through the regional facility base. Seemingly, scaling-up of the industry is the first priority, but the government is promoting various policies to expand small and medium-sized egg joint markets, with limitations in improving the problems of the existing egg distribution structure.

In particular, the introduction of auctions and bidding with high price volatility may exacerbate the problem of unstable prices, which is a major problem in the existing Korean egg industry. Therefore, the Korean government needs an egg distribution entity that can apply a transaction method that enables producers to purchase eggs at a higher price and sell them to consumers at a reasonable price in the egg distribution process, and to maintain stable prices.

The government needs to promote institutional improvement so that eggs should be traded through the regional base egg distribution entities (facilities). Next, it is necessary to create detailed information on egg production and distribution, as well as establish a storage and management system. The safety and sanitation of eggs, as well as the formation of an appropriate level of price, are basically based on information. The regular generation and management of specific information, as in the US and Europe, will be positive for transparency in the egg distribution structure in Korea, in addition to securing a reasonable operating system. To implement this policy, the distribution channel should be simplified to facilitate the management of the distribution structure.

Currently, eggs are included in livestock products subject to the livestock product traceability system in Korea.

Therefore, it is possible to collect various information related to eggs. However, in the case of the current livestock product history system, most of the information is consumer-oriented. Accordingly, a system for collecting information considering producers should be established.

This study suggests directions for the development of Korea's egg industry based on the various items of information of other countries. Nevertheless, it has a limitation, as there are slight differences between countries as of when the information is gathered, and this should be complemented in future research.

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