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Determination of the General Structure of the Enterprises Producing Eggs in Organic System in Ordu Province

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Abstract

In this study, it was aimed to determine general structure of the enterprises engaged in organic system egg production in Ordu province. For this purpose, the data obtained from face-to-face surveys with 47 breeders who produce eggs in organic system in Ordu province were used in this study. In the study, 68.1% of organic system poultry breeders are older than 41 years and 46.8% of all breeders are farmers by occupation. It was determined that 83% of the egg production enterprises were established in the under-hazelnut land and 55.3% of them used sandwich panels in poultry house construction. 85.1% of the enterprises provided ventilation in the poultry house with a fan, 68.1% used individual nest boxes, 93.6% used nipple type drinkers and 83% preferred paddy husk as litter material. The number of hens was 750 or more in 68.1% of the enterprises and Lohman Brown breed hens were used in 97.9% of the enterprises. 51.1% of the enterprises had 6 or more hens per square meter (m^2) in the roaming area and 48.9% had 4 hens per square meter (m^2) in the indoor area. At the same time egg yield was higher than 81% in 70.2% of the enterprises.

Introduction

Most consumers prefer eggs produced through alternative production systems that apply food safety regulations since animal rights started to be considered important in egg production systems (Anderson, 2009). There are various alternative production systems available such as free range, organic, enriched cage, aviary, and deep-litter systems (Şekeroğlu et al. 2010; Türker and Alkan, 2018). Among these, organic system egg production has gained more importance especially in recent years. In developed countries, there has been a demand in organic system poultry breeding by the consumers, because of welfare concerns associated with farming of poultry under intensive conditions. For the "best positive welfare outcome", hens should be free from hunger, thirst, discomfort, pain, injury, disease, fear, and distress and able to express normal behaviors (Brambell, 1965).

Ordu province is located between 40°-41° North Parallels and 37°-38° East Meridians. The geographical structure of Ordu province is hilly and almost all the agricultural lands are hazelnut gardens. While producers provide their income from hazelnut in certain periods of the year, they remain inactive in the remaining months. In addition to hazelnut, the development and implementation of other alternative production activities in Ordu province is very important in preventing migration from the village to the city. In this regard, producers can combine hazelnut cultivation and organic system egg poultry farming in their lands and benefit from the synergistic effect of these two forms of

production and provide additional income. With this production combination, chickens graze in hazelnut gardens and save approximately 5-10% in terms of feed consumption, while the weeds in the gardens are cleaned by chickens without additional labor costs (Anonymous, 2014; Derebaşı and Alkan, 2018).

Organic agriculture is a form of production based on soil fertility and food safety without the use of artificial inputs such as chemical fertilizers and pesticides, which is sustainable, does not harm the environment and human health and at the same time supports, registered, controlled, and most importantly certified from production to consumption. Organic agriculture is a system developed and developing with principles such as protecting future generations, ensuring the continuity of water existence, minimizing chemical pollution, preventing soil loss, making more profit from the products produced, contributing to economic development, increasing biodiversity, and bringing rich-flavored natural products to consumers. Unlike conventional agriculture, organic agriculture combats pests and diseases without the use of synthetic pesticides, herbicides, chemical fertilizers, growth hormones, antibiotics, and modified genes.

Breeders who prefer organic farming support the reduction of pollution while protecting the existing ecological system (Öztürk and Türkoğlu, 2012; Bardakçı, 2021). Organic laying hen breeding differs from the poultry breeding referred to as village hens (natural hens) in that hens can roam freely in the area with organic soil surrounded by certain boundaries and fed with organic feed (Balık, 2016). Although there are some similarities between free-range poultry breeding and organic system poultry breeding, the compulsory certification process in organic system poultry breeding causes it to be less preferred (Balık, 2016). For the organic system egg poultry producers to market their products organically, they must first make a mutual contract with any certification body authorized by the Ministry of Agriculture and Forestry. In the process following the contract, the area, and animals to be farmed organically are taken into the transition process and organic activity is officially started. In organic farms, land and grasses are taken into transition period for 2 years and poultry animals to be used in egg production are taken into transition period for 6 weeks (Öztürk and Türkoğlu, 2012).

Hen breeds to be selected for use in the organic system should be selected from breeds that can adapt to the conditions of the environment where the poultry house is located and are relatively more resistant to diseases. The breeders to be selected should be selected from breeds whose genetic structure has not been modified, completely fed with organic feed, and especially adapted to the region where they will be raised (İpek and Sözcü, 2015). The hens needed for organic egg production should be obtained from enterprises with proven organic production or from breeding enterprises that do not pose salmonella risk for organic production. The enterprise to be established for organic system egg production can be realized from conventional enterprises, provided that the hens are not older than a certain week, as well as from organic enterprises (Öztürk and Türkoğlu, 2012).

In organic system laying hens breeding, the hen houses should be planned in such a way that the hens can go out of the hen house whenever they want, easily access food, and water, and perform some physical and physiological behaviors comfortably (such as self-cleaning, scratching, stretching, flapping wings) and thus minimize stress. The roaming area should be sheltered with vegetation, enough feeders should be provided, and 16 hours of lighting time should be applied to the hens (İpek and Sözcü, 2015; Öztürk and Türkoğlu, 2012; Durmuş and Alkan, 2015; Sözcü and Yılmaz, 2014).

The indoor part of the hen house should be of sufficient size to protect the hens from diseases, clean, provide adequate air flow and protect them from dust. The floor of the poultry houses should be covered with materials such as straw, sawdust, sand, or short grass and more than 1/2 of it should be designed to be suitable for collecting feces. Entry-exit holes at least 4 m in length and 30-35 cm in height should be planned for every 100 m² of the poultry house floor area so that chickens can easily enter and exit the poultry house.

The poultry houses should be positioned in a way that is favorable for natural ventilation and light entry. A perch area of 18-20 cm per hen and a nesting box for 6-7 hens or 120 cm² nesting box area per hen should be provided (Öztürk and Türkoğlu, 2012; Durmuş and Alkan, 2015; İpek and Sözcü, 2015; Sözcü and Yılmaz, 2014). In this study, it was aimed to determine the general structure of the enterprises engaged in organic system egg production in Ordu province.

Material and Method

Material

In this study, face-to-face interviews were used as data collection method and questionnaire forms prepared to measured research variables were used as data collection tool. After the questionnaire was explained to the owners of the enterprises to which the questionnaires were to be applied, it was ensured that the participants answered the questions in a healthy way. In this study, 9 of the questions in the questionnaires are about demographic characteristics, 29 of them are about poultry enterprises, 11 of them are about health and nutrition of hens, 11 of them are about sales and marketing of eggs, 10 of them are egg producers' association, 3 of them are about Covid-19 epidemic, and a total of 75 questions were used in the survey.

Method

Sample of the Study

The sample of the study consisted of 47 enterprises that produce eggs in organic system in Ordu province.

Statistical Analysis

First, frequency values (n and %) were calculated by frequency analysis of the answers given by the participants to all the questions in the survey. SPSS (2008) statistical package program was used in the calculations.

Findings and Discussion

Demographic Characteristics of Producers

The basic findings (n and %) on the individual characteristics of the breeders practicing laying hens in the organic system and the socio-demographic and economic characteristics of the families are given in Table 1. In study, 68.1% of the enterprise owners are older than 41 years and 46.8% of all breeders are farmers by occupation. At the same time, 55.3% of the breeders have less than 4 people in their households. It was determined that 2.1% of the breeders included in the study were illiterate, 42.6% were primary and secondary school graduates, 38.3% were high school graduates and 17% were university graduates.

While 74.5% of the enterprise owners stated that they did not participate in any training or course on poultry, 85.7% of those who did not participate stated that they would like to participate in a training or course on hen breeding. It was also determined that 61.7% of the breeders' social security is the Social Security Institution. At the same time, 85.1% of the breeders stated that they own the ownership of their enterprises, while 61.7% stated that they do not use agricultural loans. Çimrin *et al.* (2019), in their study on egg poultry enterprises in Hatay province, stated that approximately 40% of the producers were between 36-50 years old and 35% were over 51 years old, and Cönk (2006) stated that 42.6% of the producers were between 36-50 years old and 50% were 51 years old and over. In the same study, 55.6% of the breeders stated that they were engaged in breeding as an occupation and 63% stated that the number of households was less than 4 people. It was determined that 1.9% of the breeders included in the study were illiterate, 35.2% were primary and secondary school graduates, 46.3% were high school graduates and 16.7% were university graduates. In the study conducted by Sarıca *et al*. (2020) average age of the producers was found to be 53. It was also determined that 50.7% of the enterprise owners were primary school graduates, 33.6% were middle school graduates, 13.6% were high school graduates, and 5.8% were university graduates. Aydın and Çelen (2011) in Gaziantep, Diyarbakır, Şanlıurfa, Batman, Adıyaman**,** Kilis and Mardin provinces, it was found that all poultry enterprise owners in Batman province were primary school graduates, whereas all poultry enterprise owners in Gaziantep province were university graduates.

Köse and Durmuş (2014) reported that 31.5% of the producers were primary school graduates, 58% were secondary and high school graduates, and 10.5% were university graduates in their study conducted in poultry enterprises in Ordu province. While 74.1% of the breeders stated that they did not participate in training or courses related to poultry, 70% of those who reported that they did not participate in training stated that they wanted to participate. In the study, it was determined that 38.9% of the breeders were affiliated to the Social Security Institution in terms of social security. While 81.5% of the breeders stated that the ownership of the enterprise belonged to them, 63% of them stated that they had never used agricultural credit.

Main Findings Regarding the Enterprises Producing Eggs in Organic System

The main findings (n and %) related to the general characteristics of laying hen enterprises in organic system are given in Table 2. In this study, 83% of the breeders stated that their enterprises were established under hazelnut land and 17% in open land. At the same time, it was determined that 55.3% of the breeders preferred to use sandwich panels in poultry house construction, while 44.7% of them used concrete material. While 85.1% of the organic system poultry breeders use fans to provide ventilation in the poultry house, 12.8% use chimney and window, and 2.1% use only window. Keeping the temperature and relative humidity at optimum levels in poultry houses, removal of harmful gases released by animals and animal welfare are directly related to the ventilation capacity and quality of the poultry house (Akkaya and İşgüzar, 2006).

While 68.1% of the breeders in the study stated that they used individual nesting boxes and the remaining 31.9% used group nesting boxes in their poultry houses, 93.6% of the breeders stated that they gave water to the hens with nipple type drinkers, 2.1% with hanging round type drinkers, and the remaining 4.2% with trough type and other type drinkers. As litter material, 83% of the breeders stated that they used paddy husk, 12,8% thick sawdust, 2,1% fine sawdust, and the remaining 2,1% other materials. Also, 78,7% of the breeders stated that they applied 16 hours of lighting to the hens, 12,8% 12 hours, and 8,5% daylight. In this study, 91,5% of the breeders stated that hens can find green grass in the grazing area throughout the year. Again, 68.1% of the breeders stated that the number of hens in their holdings was 750 and above, 25.6% stated that it was between 250-750, and 6.4% stated that it was 250 and below. Lohman Brown and Atak'S genotypes

were used in 97.9% and 2.1% of the enterprises, respectively. In this study, it was determined that Lohman Brown breed hens were mostly (97.9%) used in organic system poultry enterprises in Ordu province.

Similarly, in the study conducted by Köse and Durmuş (2014) in Ordu province, it was reported that Lohman Brown and Hy-Line Brown breeds of hens were used in most of the poultry enterprises, and in the study conducted by Çimrin *et al.* (2019) in Hatay province, it was reported that Atak-S and Lohman Brown and Nick Brown breeds of hens were raised in 52.18% and 47.82% of the enterprises, respectively. In this study, 83% of the breeders stated that they purchased their hens at the age of 16-18 weeks, 10.6% at the age older than 18 weeks, and 6.4% at the age younger than 14 weeks. Again, 87.2% of the breeders stated that they used their hens in production for 71 weeks and over, 10.6% between 61-70 weeks of age and 2.1% for less than 50 weeks. At the same time, it was determined that 83% of the breeders purchased the hens as pullets. Of the breeders included in the study, 57.4% of the breeders reported that they purchased the hens by their own means and the remaining 42.6% of the breeders reported that they purchased the hens through the Egg Producers' Association. Also, 78.8% of the breeders who participated in the survey stated that they did not want to raise the chicks they used themselves. It was determined that 51.1% of the enterprises had 6 or more hens per m² in the grazing area, 23.4% had 4, 14.9% had 3 and 10.6% had 5 hens. Again, 48.9% of the breeders stated that there were 4 hens per m² in the indoor area, while 40.4% stated that there were 6 or more hens and 10.6% stated that there were 5 hens. At the same time, 72.3% of the breeders stated that the mortality rate in their enterprises was less than 5%, 25.5% stated that it was between 6-10% and 2.1% stated that it was between 11-15%. In the study conducted by Tuğluk and Yalçın (2004) in Nevşehir/ Kozaklı, it was reported that the mortality rate in laying hen enterprises was 5.9% on average. While all the breeders stated that they regularly calculate egg yield in their enterprises, 70.2% of them stated that egg yield was more than 81% and the remaining 29.8% stated that it was between 61-80%. While 57.4% of the breeders stated that they did not use any worker in their enterprises, 36.2% stated that they employed 1 (6.4%) or 2 (29.8%) people. Köse and Durmuş (2014) reported in their study conducted in poultry enterprises in Ordu province that 82.4% of the enterprises employed 1 person and 17.6% employed 2 people. According to this result, it is seen that the poultry enterprises in the organic egg production system in Ordu province continue egg production by using very few workers. Tuğluk and Yalçın (2004) reported that chickens were used in production for an average of 71 weeks, between 52 and 86 weeks, except for the pullets' period, in their study on egg poultry enterprises in Kozaklı/Nevşehir. Among the breeders participating in the study, 89.2% stated that they had a feed store in their enterprises. While 63,8% of the breeders stated that they were engaged in egg poultry breeding for additional livelihood, 14,9% of the breeders reported that they were engaged in egg poultry breeding as their main livelihood.

While 51.1% of the breeders have been poultry breeding for 4 years or more, 19.1% have been poultry breeding for 1 year, 19.1% for 2 years and 10.6% for 3 years. While 85.1% of the breeders stated that they would continue to keep organic laying hens, 70.2% of them stated that they were planning to expand their enterprises. Cönk (2006) reported in his study on egg poultry production in Afyonkarahisar that approximately 67% of the breeders engaged in egg production would not continue egg production. While 66% of the breeders reported that they do not breed any other animal species other than poultry, it was determined that 75% of the breeders who breed an additional animal other than poultry breed cattle and 25% of them breed small ruminants. At the same time, while 83% of the breeders reported that their enterprises were adequately inspected, it was determined that 78.8% of those who expected feed support from public institutions and organisations, 14.9% of those who expected pullets support and 6.4% of those who demanded cash aid.

Main Findings on the Health and Nutritional Status of the Hens Used in Egg Production

The main findings (n and %) on the health and nutritional status of the hens used in the organic system are given in Table 3. While 70.2% of the breeders stated that they received help from a freelance veterinarian in the fight against diseases, 97.9% of them stated that they routinely disinfected their poultry houses to prevent diseases. In addition, 63.8% of the breeders stated that the quality control of the water given to the hens is carried out at certain intervals. At the same time, 93.7% of the breeders stated that they obtained the feed they used in their enterprises from any feed factory (51.1%) and from the feed factory of the Egg Producers' Association (42.6%), while 6.4% of the breeders reported that they made the feed themselves. Consistent with the data obtained in this study, Çimrin *et al*. (2019) reported that 86.96% of the poultry enterprises in Hatay and Tuğluk and Yalçın (2004) reported that 67% of the poultry enterprises in Nevşehir/Kozaklı preferred to buy feed. On the other hand, Cönk (2006) stated in his study that approximately 76% of the hen's breeders procure the feed they use by their own means. Breeders who try to gain an economic advantage by producing feed themselves face high raw material costs. While 66.7% of the breeders who met their feed needs with their own means stated that they preferred this way to have healthier feed, 52.3% of the breeders who met their feed needs by purchasing feed stated that they preferred to buy feed because they did not have sufficient technical knowledge. At the same time, 87.2% of the breeders stated that they had information about the content of the feed they used. In animal husbandry, especially in egg poultry enterprises, the most important part of the costs in the enterprises is feed expenses (65-70%). Therefore, in order to solve the feed problem of poultry enterprises in Turkey, projects should be developed to increase the production of feed raw materials and breeders should be supported

in this regard. Again, 93.6% of the breeders stated that they always keep feed in front of their hens and 95.7% of the breeders stated that they do not feed their hens other than the recommended feed.

At the same time, 100% of the breeders stated that they calculated the amount of feed consumed by the hens and in 95.8% of the enterprises, the average feed consumption per hen was 100-130 grams.

Main Findings on Sales and Marketing of Eggs Produced

The main findings on the sales and marketing of eggs produced in the organic system are given in Table 4. In this study, 97.9% of the breeders who are engaged in organic system poultry breeding stated that the eggs obtained from hens raised in the organic system are better. When the breeders were asked why consumers should prefer eggs obtained from hens raised in the organic system, 85.1% of the breeders stated that these eggs were healthier and 14.9% stated that they thought that these eggs were more nutritious. It was determined that 91.5% of the breeders who participated in the questionnaire preferred open viol and the remaining 8.5% preferred closed cardboard viol when marketing the eggs. It was stated that 55.3% of the breeders marketed the eggs they produced themselves and 40.4% of them sold them to the Egg Producers' Association.

In the study conducted by Köse and Durmuş (2014), it was determined that only 23% of the poultry breeders in Ordu province marketed the eggs with their own means, while the remaining 77% marketed the eggs through cooperatives. On the other hand, in a study conducted by Tuğluk and Yalçın (2004) in laying hen enterprises, it was determined that only 20% of the eggs produced were marketed by the producers' own means. When the study conducted in Ordu province is examined, it is determined that there is a decrease in the preference of the enterprises in Ordu province to market the eggs they produce with institutions such as unions or cooperatives compared to the study conducted in previous years. It is thought that this situation encountered in Ordu province is caused by the problems experienced by producers with institutions such as unions or cooperatives. Both the Covid-19 pandemic, and the global economic crisis have a direct impact on egg prices and current prices are constantly changing. When the breeders were asked "What measures do you take in periods when egg prices experience large decreases in the short term and you have to sell at a loss?", 87.2% of the breeders stated that they desperately wait for egg prices to rise and continue egg sales without reducing feed, 6.4% of them keep the eggs in cold storage, and the remaining 6.4% stated that they dispose of the hens at a loss and stop egg production. Therefore, alternative systems should be established to make use of the processability of the egg for the producer to skip the egg production process with the least damage during the periods when the egg market is moving, and the producer should be prevented from stopping the egg production by disposing the hens. When the breeders were asked "What do you suggest increasing egg sales?", 31.9% of the breeders stated that they thought that television-radio advertisements should be made to encourage egg consumption and 31.9% of the breeders stated that information activities should be carried out to explain the health benefits of eggs. At the end of the production period, 34% of the breeders who participated in the survey stated that they sent their hens to a slaughterhouse, 36.2% of them sold them to a wholesale company and the remaining 29.8% of them sold them through the Egg Producers' Association. Also, 70,2% of all breeders stated that they use the manure obtained from hens on their own land. To the question "How do you see the future of organic system poultry breeding?", 72.3% of the breeders answered that it will be better.

Main Findings Regarding the Egg Producers' Association

The main findings related to the opinions of the breeders about the Egg Producers' Association are given in Table 5. In this study, 55.3% of the organic system poultry breeders stated that they were not members of the Egg Producers' Association. When the breeders were asked "Does the Egg Producers' Association meet your expectations?", 66% of the breeders answered no and 57,7% of the breeders who were not members of the Egg Producers' Association stated that they became members because they thought that the Egg Producers' Association was not well managed. To the question "What are your suggestions?" asked in order for the Egg Producers' Association to meet the expectations of the breeders, the breeders verbally stated that the contracted production model should be switched to give a purchase guarantee to the breeders, expert veterinarian support should be provided in poultry, the feed provided to the breeders by the association should be of high quality and continuity, and the importance of organic eggs should be conveyed to the citizens more clearly both in social media and in billboards and advertisements with prepared conversions.

All the breeders who are members of the Egg Producers' Association reported that they received their payments in the form of money-feed-violet and at the appropriate time without any problems. To the question "Do you think that there are enough meetings in the Egg Producers' Association?", 81% of the breeders answered yes, while 75% of those who said no stated that there should be at least one meeting per month. Again, 90.5% of the breeders answered yes to the question "Are you aware of the dates of the meetings held or to be held in the Egg Producers' Union and the decisions taken?"

Main Findings Regarding Covid-19 Pandemic

The main findings regarding the level of the organic system poultry breeders being affected by the Covid-19 pandemic are given in Table 6.

To the question "Has the Covid-19 pandemic affected your egg sales prices?", 76.6% of the breeders answered yes, and 72.2% of the breeders affected by the pandemic stated that egg prices were positively affected. Also, 77.8% of the same breeders stated that they estimated that the effect of the Covid-19 pandemic would last longer than 12 months.

Main Findings of Digital Marketing (DITAP)

The main information about the level of knowledge of the organic system poultry breeders about digital marketing is given in Table 7. To the question "Do you have information about digital marketing?", 59,6% of the breeders answered yes and 74,5% of all breeders stated that they wanted to sell without intermediaries through digital marketing.

Conclusion and Recommendations

Organic egg production system has its own advantages and disadvantages. Factors such as the storage conditions of eggs produced in the organic system and the time until sale are very effective. For this reason, it is very important to determine the general structure of the enterprises producing eggs in the organic system and to reveal the deficiencies correctly and the results of such studies should be well examined. According to the results obtained from this study; 46,8% of the breeders who are engaged in organic system egg poultry breeding are farmers. According to the results obtained from this study, it can be said that the main problem of the enterprises engaged in organic system egg poultry breeding in Ordu province is economic problems. The development of any sector is in parallel with the export power. For this reason, the planning of how these enterprises will market the eggs they produce should be made and signed in advance. If the existing marketing opportunities are not sufficient, new marketing opportunities should be searched. Thus, both the economic burden of the enterprises producing eggs in the organic system can be reduced and the motivation of the producers to make production can be increased.

It has been determined that the success of the enterprises in terms of animal welfare and egg production in organic system poultry breeding is related to good care-feeding and management techniques. The sustainability of the enterprises is closely related to the analysis of factors such as the system used, the preferred genotype, the age of the genotype, care-feeding and environmental conditions. For this reason, organic egg producing enterprises in Ordu province should be closely monitored and necessary studies should be carried out to determine their status precisely. People need to consume enough animal origin nutrients to sustain their lives in a healthy way. One of the nutrients of animal origin that they should consume is eggs. For this reason, first, egg production enterprises should be properly controlled, the deficiencies seen should be eliminated and sufficient egg production should be realized. At the same time, consumers should be sufficiently informed about the organic system egg production, which is an alternative egg production system.

In order to be able to market the eggs produced by the enterprises producing eggs in the organic system in Ordu province, firstly, continuity and uniformity in the domestic market should be ensured. This is only possible if the producers can work in harmony with the union or cooperative in Ordu province. Thanks to a fair and active union-cooperative structure, both breeders and the poultry sector in Turkey will win. For this reason, it should be aimed that all unions and co-operatives throughout the country should carry out joint works with a common mission and vision and should be brought together routinely to create an internal power for the foreign market by being supervised by the relevant institutions. Sectoral trainings should be organized by the relevant institutions to focus on the deficiencies in the province of Ordu, taking into consideration the high rate of requests of the breeders to attend training/courses related to poultry breeding. In order to minimize the damage to the breeders from the possible supply-demand imbalance, sufficient number and quality of egg storages should be established in Ordu province to store the eggs produced for a certain period of time. Based on the fact that eggs are a processable foodstuff, advanced processing technologies should be used and made widespread to make the eggs produced more suitable for export. In this way, the transportation of raw eggs, which are transformed into forms such as liquid yellow and liquid white, frozen eggs, and dry egg powder, will be facilitated and the yield and quality of the unit product will increase. In this context, necessary innovative and technological steps should be taken in Ordu province, studies on this subject should be supported, and investors should be encouraged.

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Table 1. Demographic characteristics of breeders

No	Demographic characteristic	Options	Frequency	
			n	%
1	Age of breeders	< 30 ages	6	12,8
		31- 40 ages	9	19,1
		41-50 ages	17	36,2
		> 51 ages	15	31,9
		Total	47	100,0
2	Occupation of breeders	Farmer	22	46,8085106382978750
		Self-employment	9	19,1489361702127670
		Veterinary technician/Physician Agricultural technician/Engineer	0	0
		Civil Servant/Worker	7	14,8936170212765950
		Retired	9	19,1489361702127670
		Total	47	100,0
3	Breeder's education status	Illiterate	1	2,1
		Primary-Secondary School	20	42,6
		High School	18	38,3
		University	8	17,0
		Total	47	100,0
4	Number of breeder's households	< 4 persons	26	55,3
		4 – 6 persons	17	36,2
		7 < persons	4	8,5
		Total	47	100,0
5	Ownership of the enterprise	My own	40	85,1
		Rent	2	4,3
		Mine - Rent	4	8,5
		State land	1	2,1
		Total	47	100,0
6	Breeder's social security	None	11	23,4
		Social Security Organization for Artisans and the Self-Employed	6	12,8
		Social Security Institution	29	61,7
		Green Card	1	2,1
		Total	47	100,0
7	Participation of breeders in training/course on poultry breeding	I joined	12	25,5
		I did not participate	35	74,5
		Total	47	100,0
8	If you have not attended the training or course, would you like to attend?	Yes	30	85,7
		No	4	11,4
		I have no idea	1	2,9
		Total	35	100,0
9	Agricultural credit utilization status of breeders	Bank	18	38,3
		Agriculture and Credit Co-Operative	0	0
		Chamber of Agriculture	0	0
		I not used	29	61,7
		Total	47	100,0

Table 2. Main Findings Regarding the Enterprises Producing Eggs in Organic System

No	Questions	Options	Frequency	
			n	%
1	What is your reason for keeping egg poultry?	Main source of livelihood	7	14,9
		Additional livelihood	30	63,8
		Because it's snowy	6	12,8
		I don't have anything else to do	4	8,5
		Total	47	100,0
2	How many years have you been keeping egg poultry?	1 year	9	19,149
		2 years	9	19,149
		3 years	5	10,638
		4 years and more	24	51,064
		Total	47	100,0
3	Do you breed animals other than hens?	Yes	16	34,0
		No	31	66,0
		Total	47	100,0
4	If yes, what is it?	Cattle	12	75,0
		Sheep or Goat	4	25,0
		Bee	0	0
		Others	0	0
		Total	16	100,0
5	Do you plan to expand your enterprises?	Yes	33	70,2
		No	13	27,7
		I'm thinking about quitting	0	0
		I have no idea	1	2,1
		Total	47	100,0
6	What is the structure of the land where your enterprise is located?	Under hazelnut	39	83,0
		Open land	8	17,0
		Other	0	0
		Total	47	100,0
7	What materials did you use to build the hen house?	Concrete	21	44,7
		Sandwich Panel	26	55,3
		Other	0	0
		Total	47	100,0
8	What type of nest box do you use in your hen house?	Individual	32	68,1
		Group	15	31,9
		I do not use	0	0
		Total	47	100,0
9	How do you provide ventilation in your hen house?	Fan	40	85,1
		Window	1	2,1
		Chimney	0	0
		Chimney + Window	6	12,8
		Total	47	100,0
10	How do you give water to the chickens in your hen house?	With gutter type drinker	1	2,1276595744680850
		With nipple type drinker	44	93,6170212765957500
		With hanging round drinker type	1	2,1276595744680850
		Other	1	2,1276595744680850
		Total	47	100,0
11	How much lighting time do you apply to the hens during the laying period?	As daylight	4	8,5
		12 hours	6	12,8
		16 hours	37	78,7
		24 hours	0	0
		Total	47	100,0
12	Do hens have year-round access to green grass in the roaming/grazing area?	Yes	43	91,5
		No	4	8,5
		Total	47	100,0
13	How many people work in your enterprises?	None	27	57,4
		1 worker	3	6,4
		2 workers	14	29,8
		> 3 and above	3	6,4
		Total	47	100,0
14	How many hens do you have in your enterprises?	< 250 hens	3	6,3829787234042550
		250 to 500 hens	6	12,7659574468085100
		500 to 750 hens	6	12,7659574468085100
		>750 hens	32	68,0851063829787200
		Total	47	100,0

15	What do you use as litter material in your enterprises?	Thick sawdust	6	12,8
		Fine sawdust	1	2,1
		Paddy husk	39	83,0
		Other	1	2,1
		Total	47	100,0
16	Which hen breed do you use in your enterprises?	Tinted	0	0
		Lohman Brown	46	97,9
		Nick-Brown	0	0
		Atak-S	1	2,1
		Hy-Line Brown	0	0
		Total	47	100,0
17	At what age do you buy the hens you use in production?	< 12 weeks	2	4,3
		12-14 weeks	1	2,1
		16-18 weeks	39	83,0
		> 18 weeks	5	10,6
		Total	47	100,0
18	Would you like to breed chicks yourself?	Yes	10	21,3
		No	37	78,7
		Total	47	100,0
19	Do you calculate egg yield at certain intervals in your enterprise?	Yes	47	100,0
		No	0	0
		Total	47	100,0
20	What is the average egg yield in your enterprise?	< % 60 %	0	0
		61-70 %	3	6,4
		71-80 %	11	23,4
		> %81 %	33	70,2
		Total	47	100,0
21	What is the mortality rate from various causes in your hen house?	Less than 5%	34	72,3404255319149000
		6-10 %	12	25,5319148936170200
		11-15 %	1	2,1276595744680850
		More than 15 %	0	0
		Total	47	100,0
22	How many weeks of age do you use the hens in production (excluding the pullet period)?	< 50 weeks	1	2,1276595744680850
		51-60 weeks	0	0
		61-70 weeks	5	10,6382978723404250
		>71 weeks	41	87,2340425531915000
		Total	47	100,0
23	Where do you buy your hens?	By my own means	27	57,4
		From the Egg Producers' Association	20	42,6
		From the Chamber of Agriculture	0	0
		Total	47	100,0
24	Do you plan to continue egg poultry breeding?	Yes	40	85,1
		No	7	14,9
		Total	47	100,0
25	How many hens per m² in the grazing area of your hen house?	3 hens	7	14,9
		4 hens	11	23,4
		5 hens	5	10,6
		6 and more hens	24	51,1
		Total	47	100,0
26	How many hens per m² in the indoor area of your hen house?	3 hens	0	0
		4 hens	23	48,9361702127659600
		5 hens	5	10,6382978723404250
		6 and more hens	19	40,4255319148936100
		Total	47	100,0
27	Is there an egg and feed storage unit in your enterprise?	Yes	42	89,4
		No	5	10,6
		Total	47	100,0
28	Is your enterprise adequately audited?	No	39	83,0
		No	8	17,0
		Total	47	100,0
29	What are your expectations from public institutions and organisations?	Feed support	37	78,7
		Training/course support	0	0
		Pullets support	7	14,9
		Cash aid	3	6,4
		Total	47	100,0

Table 3. Main findings related to the health and nutritional status of the hens used in egg production

No	Questions	Options	Frequency	
			n	%
1	Is regular disinfection applied in your poultry house?	Yes	46	97,9
		No	1	2,1
		Total	47	100,0
2	How do you fight against diseases in your poultry house?	With the help of the Provincial/District Directorate of Agriculture and Forestry	6	12,8
		With the help of a freelance veterinarian	33	70,2
		With my own means	8	17,0
		Total	47	100,0
3	Do you always keep feed in front of the hens?	Yes	44	93,6
		No	3	6,4
		Total	47	100,0
4	Where do you get the feed?	I make it myself	3	6,3829787234042550
		I buy from any feed factory	24	51,0638297872340400
		I buy from the feed factory of the Egg Producers' Association	20	42,5531914893617000
		Toplam	47	100,0
5	Do you feed your hens other than the recommended commercial feed?	Yes	2	4,3
		No	45	95,7
		Total	47	100,0
6	Do you calculate the feed consumption of hens?	Yes	47	100,0
		No	0	0
		Total	47	100,0
7	Do you have any information about the content of the feed you use?	Yes	41	87,2
		No	6	12,8
		Total	47	100,0
8	What is your average daily feed consumption per hen?	Less than 100 g	2	4,2553191489361700
		100-120 g	20	42,5531914893617000
		121-130 g	25	53,191489361702250
		131-141 g	0	0
		More than 140 g	0	0
		Total	47	100,0
9	If you meet the need for feed by producing it with your own means, what is the most important reason for this?	To be able to produce cheaper	0	0
		To provide additional income by selling feed to other producers	0	0
		To be able to produce better quality feed from feed factory	1	33,3
		To produce healthier feed	2	66,7
		Total	3	100,0
10	What is the most important reason for purchasing feed?	Cheaper	2	4,5
		I do not have enough space to store raw materials	13	29,5
		I do not have sufficient technical knowledge	23	52,3
		I think it is healthier	6	13,6
		Total	44	100,0
11	Is the quality of the water you give to the hens checked at regular intervals?	Yes	30	63,8
		No	17	36,2
		Total	47	100,0

Table 4. Main findings on the sales and marketing of eggs produced in organic system

No	Questions	Options	Frequency	
			n	%
1	Do you think that eggs produced in the organic system are better?	Yes	46	97,9
		No	0	0
		I have no idea	1	2,1
		Total	47	100,0
2	Why should consumers prefer eggs produced in the organic system?	Because it's more nutritious	7	14,9
		Because it's healthier	40	85,1
		Because animal welfare is considered	0	0
		No opinion	0	0
		Total	47	100,0
3	How do you see the future of egg production in the organic system?	It'll get better	34	72,3404255319149000
		It's gonna get worse	3	6,3829787234042550
		No change	5	10,6382978723404250
		No opinion	5	10,6382978723404250
		Total	47	100,0
4	How much do you sell the eggs you produce in the organic system?	< 50 cents	1	2,1
		50-60 cents	1	2,1
		60-70 cents	5	10,6
		>70 cents	40	85,1
		Total	47	100,0
5	What do you think the unit price of the eggs you sell should be?	70 cents	1	2,1
		80 cents	3	6,4
		90 cents	4	8,5
		More than 90 cents	39	83,0
		Total	47	100,0
6	Which type of packaging do you use when selling the eggs?	Open viol	43	91,5
		Gelatine-coated viol	0	0
		Closed cardboard viol	4	8,5
		Foamed viol	0	0
		Plastic viol	0	0
		Total	47	100,0
7	How do you market your eggs?	I market myself	26	55,3
		I give to the Egg Producers Association	19	40,4
		I market it myself + I give it to the Egg Producers' Association	2	4,3
		Total	47	100,0
8	How do you utilize the chickens at the end of the production period?	I sell to any slaughterhouse	16	34,0
		I sell to any company	17	36,2
		I'm selling to the Egg Association	14	29,8
		Total	47	100,0
9	How do you utilize the manure from your chickens?	I do not evaluate	2	4,3
		Selling	12	25,5
		I use it on my own land	33	70,2
		Total	47	100,0
10	What measures do you take when you must sell your eggs at a loss?	I'm reducing the feed I give to the hens	0	0
		Desperate, I wait for egg prices to rise and continue sales without cutting feed	41	87,2
		Hoping that egg sales will increase in the short term; I keep them in cold storage	3	6,4
		I'm disposing of the hens at a loss and stopping production	3	6,4
		Total	47	100,0
11	What do you suggest increasing the sales of organic eggs?	Making television and radio advertisements to encourage egg consumption	15	31,9148936170212780
		Carrying out information activities on the benefits of eggs for health	15	31,9148936170212780
		Promotional studies should be carried out on the processability of eggs with different products	5	10,6382978723404250
		The benefits of eggs should be better explained in schools and egg consumption of students should be encouraged	4	8,5106382978723400
		Negative and false news about eggs should be prevented	8	17,0212765957446800
		Total	47	100,0

Table 5. Main Findings Regarding the Egg Producers' Association

No	Questions	Options	Frequency	
			n	%
1	Are you a member of the Egg Producers Association?	Yes	21	44,7
		No	26	55,3
		Total	47	100,0
2	If you are not a member of the Egg Producers' Association, what are the reasons for this?	Egg purchase prices set by the Egg Producers' Association are low	4	15,4
		The payment term set by the Egg Producers' Association is too long	0	0
		The Egg Producers' Association is monopolized by certain producers, and I am not satisfied with this situation	2	7,7
		I think the Egg Producers' Association is not well managed	15	57,7
		Not all egg producers produce eggs of the same quality	1	3,8
		I can market better with my own means	4	15,4
		Total	26	100,0
3	Does the Egg Producers' Association meet your expectations?	Yes	16	34,0
		No	31	66,0
		Total	47	100,0
4	If no, what is your suggestion?	-	-	-
5	How do you receive your payment from the Egg Producers' Association?	In money	0	0
		As feed and viol	0	0
		As money, feed and viol	21	100,0
		Total	21	100,0
6	Yumurta satış sonrası ödemelerinizi uygun zamanda alıyor musunuz?	Yes	21	100,0
		No	0	0
		Total	21	100,0
7	If you have not received payment at the appropriate time, how many months are you experiencing disruption?	1 ay month	0	0
		3 ay months	0	0
		5 ay months	0	0
		12 months and over	0	0
		Total	0	100,0
8	Do you think that enough meetings are held in the Egg Producers' Association?	Yes	17	81,0
		No	4	19,0
		Total	21	100,0
9	If no, how many meetings should be held per month?	1 time	3	75,0
		2 times	1	25,0
		3 times	0	0
		Total	4	100,0
10	Are you aware of the dates of the meetings held or to be held and the decisions taken?	Yes	19	90,5
		No	2	9,5
		Total	21	100,0

Table 6. Main findings on the impact of the Covid-19 pandemic

No	Questions	Options	Frequency	
			n	%
1	Has the Covid-19 pandemic affected your egg sales prices?	Yes	36	76,6
		No	11	23,4
		Total	47	100,0
2	If so, in what direction?	Positive impact	26	72,2
		Negative impact	10	27,8
		No opinion	0	0
		Total	36	100,0
3	How long do you think the impact of the Covid-19 pandemic on your enterprise will last?	3 months	4	11,1
		6 months	3	8,3
		9 months	1	2,8
		>12 months	28	77,8
		Total	36	100,0

Table 7. Main findings of Digital Marketing (DITAP)

No	Questions	Options	Frequency	
			n	%
1	Do you have information about digital marketing?	Yes	28	59,6
		No	19	40,4
		Total	47	100,0
2	Would you like to sell without intermediaries through digital marketing?	Yes	35	74,5
		No	12	25,5
		Total	47	100,0