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An Evaluation of the Market Strategies and Decisions of the Contracted Broiler Enterprises in Bolu, Sakarya and Ankara via Analytical Hierarchy Process

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Abstract

This study was performed to evaluate the decisions of the contracted broiler enterprises for the integrated company selection in terms of 5 criteria (C1: Stability, C2: Crisis management, C3: Profitability C4: Flexibility, C5: Supply). In this study, 68 enterprises were selected with stratified random sampling among the broiler enterprises, operating in Sakarya (12.0%), Bolu (11.0%) and Ankara (3.2%) those constitute 24.2% of contracted broiler enterprises in Turkey in 2017. The research was conducted with two large scales (A and B) and two small scales (C and D) integrated companies in the broiler sector, where broiler enterprises produce under a contract. According to these 5 criteria, the optimum selection of integrated companies of broiler enterprises among A, B, C, and D was analyzed using Analytical Hierarchy Process (AHP). As a result of the analysis, the importance level of C1, C2, C3, C4, and C5 criteria among 5 criteria was found strategically significant at 46.0%, 20.0%, 18.0%, 10.0% and 6.0%, respectively. Thus, C1 criterion was determined as the most dominant criterion. The selection weights of integrated companies A, B, C, and D were 34.5%, 36.7%, 12.6% and 17.1%, respectively. This result shows that working with large-scale A and B integrated companies is strategically advantageous for broiler enterprises.

Introduction

In Turkey, the chicken meat industry has shown very rapid development. The chicken meat production was 162,159 tons in 1990 and 662,096 tons in 2000, and it rose to 2,138,451 tons in 2019. This production was realized by 7,635 broiler enterprises contracted with 20 integrated broiler companies operating in overall Turkey in 2019 (Besd-Bir, 2019; Turkstat, 2020).

In Turkey, in broiler breeding, generally in the whole sector, the contract broiler farming model is contingent on the integrated companies. This production process is carried out by contracted broiler enterprises via undertaking maintenance within the framework of certain contracts and obligations to companies that combine the operations such as feed manufacturing, breeding, slaughtering, etc., within their own body under a single roof in the poultry sector. This includes growing the chicks, which are given by integrated companies to contracted broiler enterprises, up to an average of 2.5 kg between 37-42 days by contracted broiler enterprises and delivering them to the mentioned integrated companies again. In the next stage, new chicks are given by the integrated company to the contracted broiler enterprises that leave their cluster empty for at least 15 days and perform the necessary disinfection and cleaning and then a new production period is started. Thus, a breeder can produce 4 to 7 periods per year in this system (Eşidir and Pirim, 2013).

Once the contract is signed, the producer has no initiative in the input procurement, slaughtering time and marketing process. The first issue that contracted

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broiler enterprises can decide before starting production is determining the integrated company to sign a contract among the different integrated companies operating in the region and offering various contract terms. This decision affects the production performance of the contracted broiler enterprises, the success of the operating results and ultimately their profitability (Tuncel *et al.*, 2017).

Within the scope of the study, the factors that define the integrated firm selection decision of the producers were investigated by taking into account the preliminary interviews with the contracted broiler enterprises. Accordingly, the criteria most frequently used by the enterprises in their integration preferences were determined by the interviews with the contracted broiler enterprises, and gathered in 5 main groups. Thus, the criteria were determined via the field study by taking into account the references that are most frequently used by contracted producers when selecting integration.

These are C1: Stability, C2: Crisis management, C3: Profitability C4: Flexibility and C5: Supply. To briefly explain these criteria, C1 criterion is the export success and long-term production stability of the integrated company, C2 criterion is the success of the integrated company in avian influenza and similar unexpected crises. The C3 criterion is the payment terms and profitability status of the integrated company between the contracted broiler enterprises, C4 is the flexibility in the attitude of the integrated companies to the producer in determining the operating conditions, and the C5 criterion includes the quality of the supply services such as veterinary service, feed, and medicine offered by the integrated company to contracted broiler enterprises.

In this research, it was aimed to quantitatively determine the relative effect levels of the aforementioned criteria on the decision of the contracted broiler enterprises for the integrated company selection that affect the success of the contracted broiler enterprises using the AHP method. The AHP method is a decision support tool that enables a decision maker to determine the order of importance among the alternatives and choose the most appropriate one.

In the present study, it was also aimed to determine the factors that affect the decision-making process of the broiler enterprises by determining the criteria that the contracted broiler producers use most intensively in the selection of integration. In particular, the criteria that contracted broiler enterprises prefer when determining the integration they want to work with and their effect size will be better understood with this study.

The AHP method has also been used in the optimization of livestock breeders' decisions. It is possible to reach many studies in cattle breeding enterprises (Taşcioğlu *et al.* 2020), dairy cattle breeding enterprises (Wasike *et al.* 2011), beekeeping (Amiri and Arzani, 2012), and sheep breeding (Jote *et al.*, 2015).

In addition, there are numerous studies used AHP method in the broiler sector. In some of these studies, broiler enterprises were evaluated in terms of physical conditions such as equipment, technology and used litter, etc., and the physical conditions that would provide the highest efficiency with the cheapest cost were selected among the alternatives. The previous studies by Garcia *et al.* (2012) on the analysis of alternative litter material for broiler farms in Brazil, by Lima *et al.* (2017) on the comparison of alternative ventilation methods with data from 8 businesses in Brazil, and by Samadpour *et al.* (2018) on the examining the enterprises in 108 broiler enterprises in Iran in terms of equipment, insulation, management, heating and ventilation criteria can be given as examples for broiler sector.

Apart from evaluating the physical conditions of broiler enterprises using the AHP method, various studies have also used AHP for the selection and the determination of the locations of these establishments. Studies such as the analysis of the determination of the establishment location of a broiler business to be built using steel construction in India by Mahalik *et al.* (2012), the study in broiler enterprises in the Parung region of Indonesia to determine the optimum establishment location using criteria such as (1) ecology and environmental impact (2) economic infrastructure, (3) natural state and (4) vulnerability to natural disasters by Wijayanto *et al.* (2015), are the examples of such studies. In addition, similar studies were conducted by Easterling *et al.* (1986) in the USA; by Lopez and Henderson (1989) and Gempesawh and Bhargava (1990) in the four major broiler chicken production regions of the USA: Arkansas, Georgia, Alabama and, Virginia by Berry (1999) in Oklahoma; by Harrison and Sambidi (2004) in the USA and by Wijayanto *et al.* (2016) in Indonesia.

Another study is on the analysis of AHP in broiler enterprises in terms of animal welfare. Silva *et al.* (2013) compared various internationally accepted directives and norms regarding animal welfare criteria with the criteria concerning the production management, environmental management and traceability in broiler breeding using the AHP method. All of the aforementioned norms and directives were evaluated with a holistic flow and the internationally valid Global G.A.P norms were determined as the most statistically significant standard system for broiler enterprises in terms of animal welfare standards.

Our research topic is the selection of integrated companies and the AHP analysis regarding suppliers,

which is encountered in some studies in the literature. There are three important studies on this issue. In the study of Rahardjo *et al.* (2017), investigating the competitiveness of broiler enterprises in Jakarta, Indonesia, 1-customers, 2-suppliers, 3-potential entrepreneurs, 4-substitute products and 5-firms competitiveness were determined as 48.8%, 4.0%, 14.6%, 8.3% and 24.3% respectively.

Second study by Rezaei and Ortt (2013) evaluated 43 supplier companies (11 chicks, 9 feed, 6 medicine and 17 material and equipment suppliers) from which broiler enterprises purchased feed, chicks, medicine and material equipment and slaughtered their animals at the end of the 6-week production period in terms of 6 criteria consisting of price, distribution, quality, capacity, geographical conditions and financial position using the AHP method. Suppliers were divided into 4 groups according to their success levels and ranked according to their performance. Of the 43 broiler enterprises, 31 preferred to work with the 1st group, 3 with the 2nd group, 6 with the 3rd group and finally 3 with the 4th group suppliers.

In the third study, Lamsali and Ariffin (2018) evaluated the contracted broiler enterprises that are engaged in production under 4 integrated companies in Malaysia in terms of 5 criteria (1-Reliability, 2-Sharing, 3-Logistics, 4-Input and 5-Price) that affect the selection of integrated companies. In the mentioned study, the relative effects on the selection decision of the study broiler enterprises were examined, and it has been tried to determine the strategies of contracted broiler enterprises in the integrated company preferences.

In the present study, it was aimed to determine the criteria that affect the selection decisions of the contracted broiler enterprises for the integrated company in Bolu, Sakarya and Ankara in Turkey and the relative impact of these criteria on decisions of the selection.

In other words, the criteria that contracted broiler producers in Turkey take into account when evaluating integrations and the effect levels of these criteria were evaluated in this study.

In this study, Bolu and Sakarya provinces were preferred because they are at the forefront regarding the production intensity and the province of Ankara was preferred due to being forefront in terms of especially IPARD (Instrument for Pre-Accession Assistance on Rural Development) supports to observe the commercial reflexes of the new enterprises in the sector.

Both the analysis of integrated company preferences of contracted broiler enterprises and lack of scientific research using AHP analysis in the field conditions in Turkey may show the unique aspects of this study.

Materials and Methods

Data Collection

In the present study, the data were obtained via questionnaire applied by face to face interviews with the owner of 68 contracted broiler enterprises, selected by stratified random sampling, which are contracted with four different integrated companies in Bolu, Sakarya and Ankara where the contracted broiler business consists of 24% of broiler production in Turkey between January 2016 and March 2017.

The feature that distinguishes the stratified sampling method from other probability sampling methods is that all the elements in the population consist of several groups, strata, which are similar to each other according to certain characteristics. Stratification is the process of dividing population members into relatively homogeneous groups before starting sampling. Since there were contracted enterprises similar to each other and committed to certain integrations in the study, stratified sampling method was used to increase the sensitivity of the research.

Descriptive statistics of contracted broiler enterprises examined within the scope of the research are given in Tables 1 and 2. The following formula was used to determine the optimum sample size;

$$n_0 = \frac{Nt^2pq}{d^2(N-1)+t^2pq}$$

N=Population size; t = %90 t-table value for 90% confidence interval = 1.96; p, q = the frequency of occurrence of the mentioned event, from being factor (+) and factor (-) p= 0.5; q= 0.5; d= Deviation according to the frequency of occurrence of the event. Integrated broiler companies and contracted broiler enterprises within the scope of this study are given in Table 1.

Table 1. Integrated companies and broiler enterprises studied in the current research

Provinces	Broiler enterprises1-10.000 (head)	Broiler enterprises10.000-30.000 (head)	Broiler enterprises30.000 and over (head)	Broiler enterprises Total
Bolu	2	23	9	34
Sakarya	9	12	6	27
Ankara	-	4	3	7
Total	11	39	18	68

Table 2. Scales of contracted broiler enterprises affiliated with integrated companies

Production system	Broiler enterprises n	Small (1-9999)	Medium (10000-29999)	Large (30000 and over)
Integrated company A	17	7	10	0
Integrated company B	17	3	11	3
Integrated company C	17	2	12	3
Integrated company D	17	3	10	4
Total	68	15	43	10

Model and implementation steps

The AHP method was first introduced by Myers and Alpert in 1968 and then improved by Thomas Saaty in 1977 to be used as a model to solve decision making problems (Yaralioğlu, 2001; Saaty, 1980).

AHP makes complex, multi-criteria problems to be understandable by structuring and visualizing them hierarchically. Selection process, in which quantitative and qualitative criteria are used, is based on the determination of the relative importance of each criterion by the decision-maker and then choosing one of the decision alternatives by taking into account each criterion. AHP method separates the problem into components and organizes the them in a hierarchical structure. AHP has attracted attention from different sectors and found the opportunity to be applied in decision problems in many areas such as planning, determining the best alternative, resource allocation, conflict resolution, and optimization (Vaidya and Kumar, 2006).

The method adopted to the research problem of this study is presented in Figure 1.

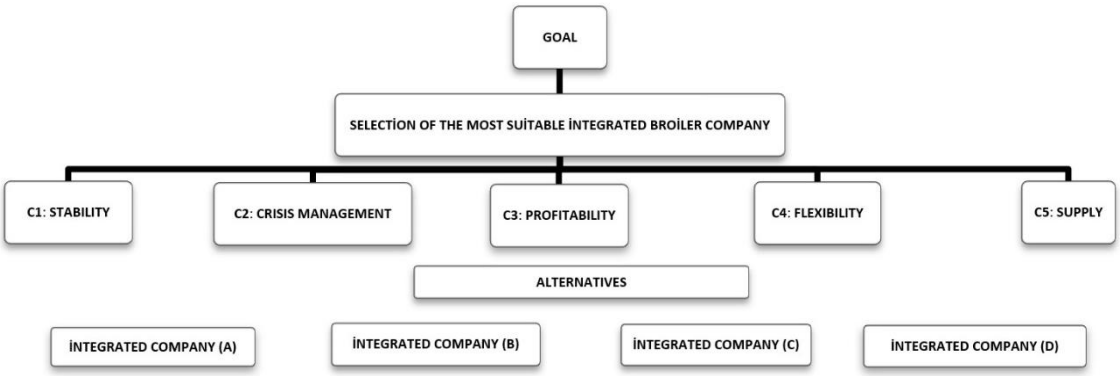

Figure 1. AHP Flowchart

As can be seen from Figure 1, in this study, integrated company preferences of contracted broiler enterprises were analyzed by AHP Method. After the flowchart was created, the relative superiority of each criterion to the others were scored using the scale of importance prepared according to the 1-9 scale used in the AHP scoring system as stated by Saaty (1980) and Soner and Onut (2006) (Table 3).

Table 3. The scale table used in Analytical Hierarchy Process

Importance level	Definition	Explanation
1	Equally important	Two activities equally contribute to the goal.
3	One and the other part the same	Experience and judgment slightly favor one activity more than another.
5	Basic or strongly important	Experience and judgment strongly favor one activity more than another.
7	Very strong or proven importance	One activity is highly preferred over another, and its superiority has been proven in practice.
9	Absolutely important	It is the situation where the preference of one activity over another is the highest.
2,4,6,8	Intermediate values adjacent to neighboring measure values	When there is a need for mediation

Results

AHP application steps

In this study, the integrated company preference strategies of the enterprises in the broiler sector were determined by AHP method. The aim of this study was to creat a guide for the public regulations and long-term sectorial rehabilitation in the broiler sector

by analyzing the pre-contract decision-making processes of broiler businesses..

Here, first of all, the decision-making problem must be defined. The related flow diagram is given in Figure 1.As a result of the survey conducted with the contracted broiler enterprises, both the criteria and alternative integrations to be selected by considering these criteria were determined according to the scores of these enterprises within the range of 1-9 that are specified in the AHP scale table. The analysis was performed by using the scores obtained from the aforementioned enterprises in the AHP analysis. Using the scale in Table 2, pairwise comparisons of different criteria is presented in Figure 2.

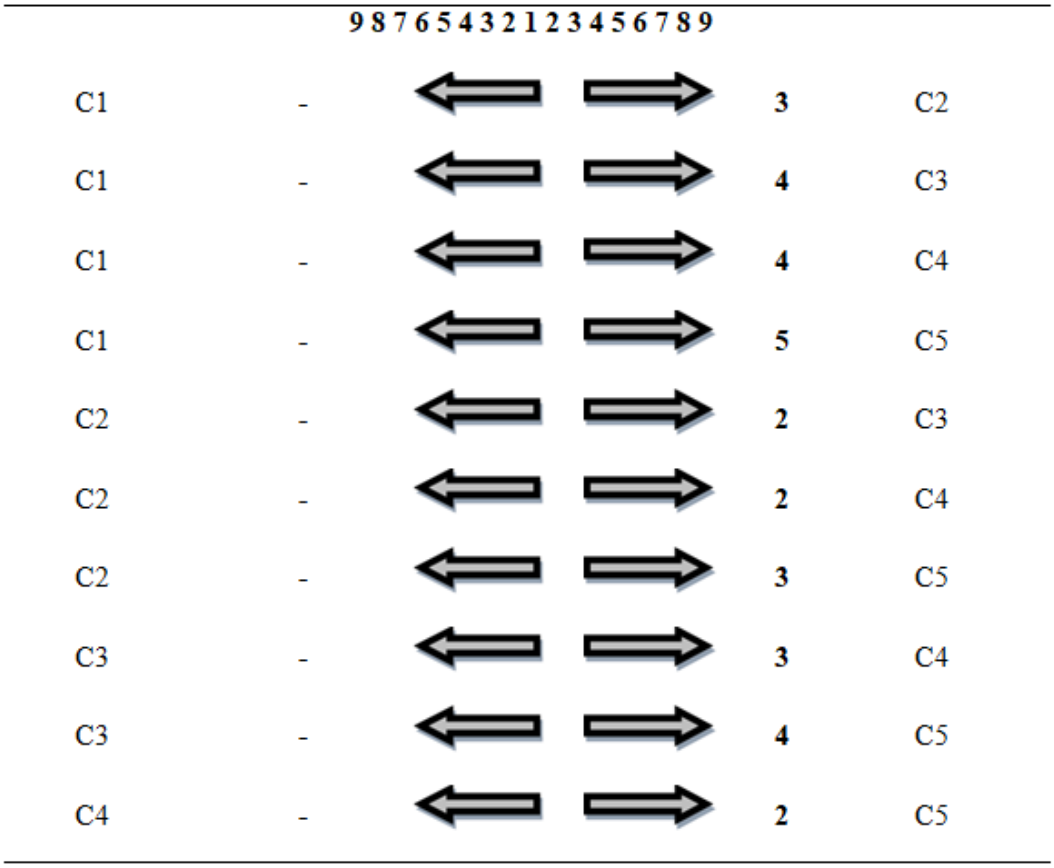

Figure 2. Pairwise comparison results of the criteria

When the findings in Figure 2 were examined; C1 criterion seems to be 3, 4, 4 and 5 AHP scores more dominant criterion than C2, C3, C4 and C5 criteria, respectively. This finding has shown that C1 criterion (Stability: Export success of the integrated firm and long-term production stability) is the most decisive criterion when choosing the integrated company where broiler businesses will work based on experience and a certain degree of judgment. Here, the results of matrix analysis for the scoring in question are presented in Figure 3.

The dominance degree of the C1, C2, C3, C4 and C5 criteria was determined as 46%, 20%, 18%, 10% and 6%, respectively, according to the matrix analysis of the comparison scores made by the contracted broiler enterprises according to the AHP scale table. It was determined that the weakest criterion was the C5 criterion while the C1 together with C2 criteria were the main criteria with 66% dominant selection weight. Thus, C1 has the strongest effect on the strategic preferences of broiler enterprises. In other words, as a result of the survey, the most important criterion was determined as the C1 criterion by the scoring of the broiler enterprises among the alternative criteria. The obtained results were determined as percentages by matrix analysis.

Within the scope of the research, taking into account 5 criteria, 4 integrated companies that are alternatives to each other were compared, with the help of pairwise comparison data, by using AHP scoring scale and the findings are presented in Figure 4.

In Figure 4, four integrated companies were compared in terms of 5 criteria. Findings obtained here, and the meaning of each criterion in detail was explained in order.

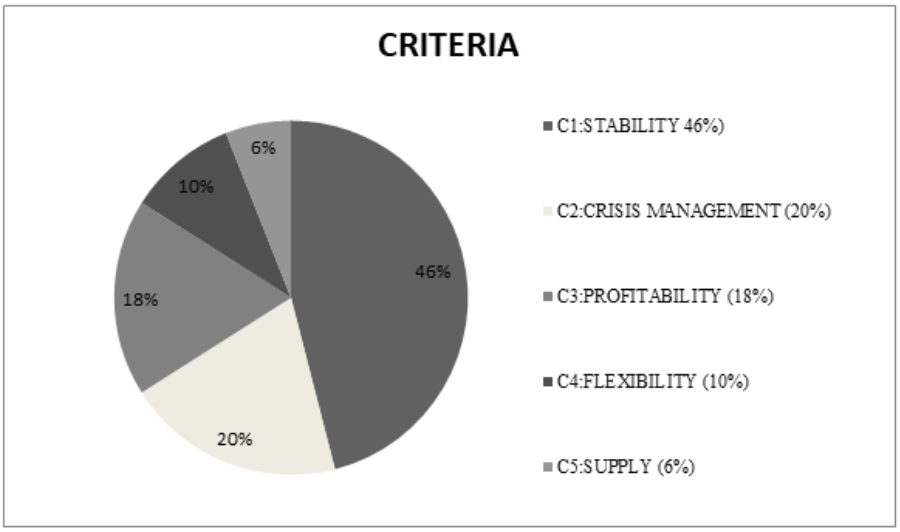

Figure 3. The relative importance of criteria in integrated company preferences

9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9							
Integration Company (A)	C1	1	⬅	➡	1	C1	Integration Company (B)
	C2	-	⬅	➡	2	C2	
	C3	1	⬅	➡	1	C3	
	C4	1	⬅	➡	1	C4	
	C5	1	⬅	➡	1	C5	
Integration Company (B)	C1	-	⬅	➡	3	C1	Integration Company (D)
	C2	-	⬅	➡	4	C2	
	C3	-	⬅	➡	2	C3	
	C4	2	⬅	➡	-	C4	
	C5	-	⬅	➡	2	C5	
Integration Company (B)	C1	4	⬅	➡	-	C1	Integration Company (C)
	C2	4	⬅	➡	-	C2	
	C3	2	⬅	➡	-	C3	
	C4	-	⬅	➡	2	C4	
	C5	2	⬅	➡	-	C5	
Integration Company (A)	C1	3	⬅	➡	-	C1	Integration Company (D)
	C2	3	⬅	➡	-	C2	
	C3	2	⬅	➡	-	C3	
	C4	-	⬅	➡	2	C4	
	C5	2	⬅	➡	-	C5	
Integration Company (A)	C1	4	⬅	➡	-	C1	Integration Company (C)
	C2	4	⬅	➡	-	C2	
	C3	2	⬅	➡	-	C3	
	C4	-	⬅	➡	2	C4	
	C5	2	⬅	➡	-	C5	
Integration Company (D)	C1	2	⬅	➡	-	C1	Integration Company (C)
	C2	2	⬅	➡	-	C2	
	C3	2	⬅	➡	-	C3	
	C4	1	⬅	➡	1	C4	
	C5	1	⬅	➡	1	C5	

Figure 4. Results of the pairwise comparison of options for each criterion

(C1) Stability

(C1) criterion is defined as the export success and long-term production stability of the integrated company. This corresponds to the fact that the products of the contracted broiler enterprises affiliated to integrated companies reach the buyers in the long term in the current market conditions and at the same time the stability of this production.

This means that companies with a wider and more diverse market range in domestic and foreign markets among integrated companies have a more stable and balanced market in terms of their production structure. Any blockage that may arise in the market can be overcome more easily through market diversity. Companies A and B, among the 4 integrated companies within the scope of the research, have large-scale production capacity (180-200 thousand tons of annual production), high brand value and an extensive customer portfolio. Firms C and D, on the other hand, are companies that produce on a relatively small scale (40-50 thousand tons of annual production), have weak brand awareness in the market and have low export potential.

Company A was superior to companies D and C with 4 and 3 AHP scores, respectively, whereas company B was superior to companies D and C with 3 and 4 AHP scores, respectively. Here, it should be remembered that 3 and 4 AHP scoring means superiority based on judgment and experience. There was no superiority between A and B companies in terms of C1 criterion. On the other hand, company D was superior to company C with 2 AHP scores.

In terms of C1 criterion, when matrix analysis of AHP scores was done, for 68 broiler businesses, integrated firms A, B, C, D were listed as 0.38, 0.38, 0.09, and 0.14 by weight, respectively. Companies A and B shared the first place, company D was determined as the second and company C was the least preferred company. This result has shown that integrated companies such as A and B, which produce on a large scale and exhibit a more successful performance in exports, are more advantageous for contracted broiler enterprises in terms of C1 criterion.

Here, it can be thought that integrations that both produce for the domestic market and operate in the foreign market by exporting can overcome the demand bottlenecks more easily because they have a more comprehensive market range.

In this study, the selection weights of the integrations according to the criteria were determined as the result of the matrix analysis of the trends obtained from the survey results of the contracted broiler enterprises. In other words, which integration was successful in terms of which criteria was determined based on the statements of the contracted broiler enterprises.

(C2) Crisis management

The C2 criterion is defined as the success status of the integrated company in avian influenza and similar unexpected crises. This criterion evaluates the crisis management skills and performance of the integrated company, especially in the domestic and foreign markets, during the epidemic periods of avian influenza and similar epidemics or pandemics such as coronavirus, macroeconomic crises and wars. The C2 criterion is also a parameter that shows the solution skill of the integrated company in the mass animal losses as a result of a disease that may occur in a broiler enterprise in any production period.

Within the scope of the research, company B was superior to A, C and D with 2, 4 and 4 AHP scores, whereas company A was found to be in a more advantageous position than firms C and D with 4 and 3 AHP scores, respectively.

When matrix analysis was done for AHP scores in terms of C2 criterion, it was determined that selection weights of companies A, B, C, D were 0.31, 0.47, 0.09 and 0.13, respectively. According to this, firm B had a clearly dominant selection weight compared to other firms (A, C, D) in terms of C2 criterion. Thus it seems rational for a new broiler enterprise to enter the market to cooperate within the scope of a contract with integrated company B when it evaluates its choices in terms of C2 criteria.

Although C2 criterion is similar to C1 criterion, the C1 criterion implies the confidence in market dominance and production stability, whereas C2 criterion implies the ability to cope with crises and confidence in crisis management skills stand out.

(C3) Profitability

The C3 criterion is defined as the payment terms of the integrated company and the profit provided to the contracted broiler enterprises. In addition, this criterion evaluates the method of calculating the payment to be made by the companies to the contracted broiler enterprises as well as the payment possibilities such as the advantage of receiving advances before the end of the production period when necessary and the payment terms etc.

Integrated companies have developed some payment methods to ensure efficient use of inputs given to producers and subsequently success in production. The first is the "Target FCR (Feed conversion ratio)" system, and integrated companies set FCR targets for certain live weights in their production areas. Producers that achieve an FCR value below the specified target are given a premium in addition to their chicken meat income. The second application is the European Performance Efficiency Factor (EPEF) system, also known as "Pool FCR". This system is a scoring system that is widely used in

the world and obtained from the parameters of average body weight, FCR, survival rate and slaughter age. The contracted broiler enterprise, whose score is calculated according to these parameters, receives an additional premium if its score is above the average, otherwise, a deduction is made. The third application is the traditional practice calculated with the revenue obtained by multiplying the live weight from a certain unit price. The broiler enterprises within the scope of the research gave importance to parameters such as the term time and how much of the payment is in cash and advance, rather than which calculation system is used. This was due to contracted broiler enterprises thinking that there are no significant differences in their revenue when compared with other enterprises using different calculation systems

In this study, although with a slight difference such as 2 AHP scores, both firms A and B were more advantageous than firms C and D respectively. When matrix analysis was done for AHP scores concerning C3 criterion, firms A, B, C, D had a selection weight of 0.330, 0.330, 0.140 and 0.200, respectively. Thus, it is strategically advantageous to work with A and B integrated companies with higher selection weight values in terms of C3 criterion.

(C4) Flexibility

The C4 criterion is defined as the flexible approach and behavior of the integrated company towards the producer. Contracted broiler enterprises may have different scale sizes, different geographical locations, and different freight costs in different procurement and different technical possibilities. Enterprises expect their disadvantage in these matters to be met with appropriate flexibility by integrated firms. For example, it is reasonable for a contracted company to expect flexibility from the integrated firm with which it will contract, regarding the disadvantages arising from its geographical location or technical deficiencies. In this case, broiler businesses may turn to a smaller-scale integrated company with flexible working conditions rather than a large-scale integrated company with strict requirements. In the present study, both companies C and D were found to be more advantageous with 2 and 2 AHP scores than A and B companies in terms of C4 criterion. When matrix analyses were made for AHP scores, companies A, B, C, and D had a selection weights of 0.170, 0.170, 0.330, and 0.330, respectively. Therefore, it was found to be advantageous to work with A and B integrations in terms of C4 criterion.

(C5) Supply

The C5 criterion is defined as the quality of procurement services such as veterinary service, feed and medicine offered by the integrated company. Integrated companies provide all inputs of broiler businesses such as veterinary services and medicine. Within the scope of this study, considering the C5 criterion, integrated firms A and B were found superior to C and D integrated firms with 2 and 2 AHP scores, respectively. When matrix analyses were made for AHP scores, firms A, B, C, D had selection weights of 0.330, 0.330, 0.170, and 0.170, respectively. According to these data, it has been determined that C and D integrated companies are more advantageous than A and B companies.

The 5 criteria mentioned here are the most dominant criteria used by contract broiler enterprises in selecting integration. Integration selection made under the influence of these criteria in the study was analyzed following AHP analysis.

4. Evaluation of the distribution of results in AHP decision points

Considering the matrix analysis of the paired comparison results of the criteria investigated in the research, the result distribution of the strategic preferences between different broiler systems is given in Figure 5.

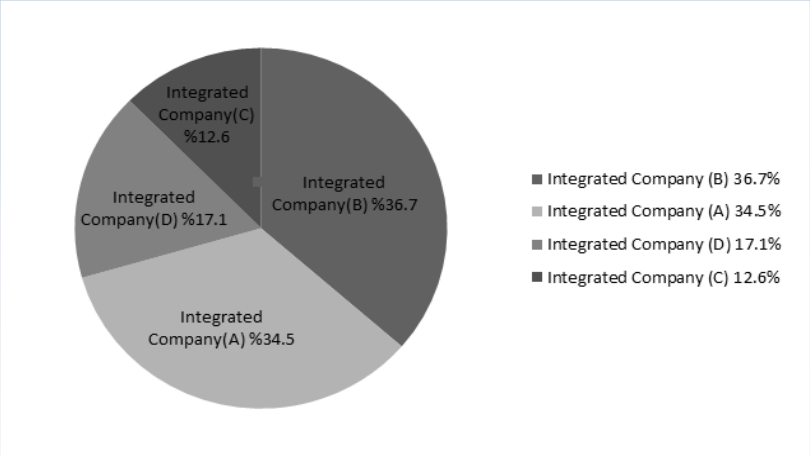

Figure 5. Result distribution weights of preferences in AHP decision points

The result distribution at decision points obtained for each criterion in Figure 5, were transformed into selection weights in terms of broiler enterprises for the integrated companies A, B, C, D. Then the result distribution was calculated as 0.345, 0.367, 0.126 and 0.171 respectively. This result gives the selection weights that broiler enterprises in the market will consider when choosing integrated companies with which they will make agreements in terms of the five criteria used within the scope of the research. Here, the most strategically meaningful integrated company was determined by considering more than one qualitative and quantitative criterion according to the result distribution at the decision points in the AHP analysis. According to this, it can be considered as a rational behavior for a contracted broiler producer intending to enter the market to choose the integrated company by prioritizing them as B, A, D and C integrated companies, in other words, to be willing to contract according to selection weights.

Discussion

In this study, selection preferences of broiler enterprises were determined by using AHP, which is one of the decision-making techniques based on multiple criteria. The integrated company selection of the contracted broiler enterprises in the poultry sector is a critical decision stage for all the businesses planned to be established considering the future competition conditions. In Turkey, in fast-growing broiler sector after the 2000s, the success profiles of an integrated broiler company become an essentialessential reason for the contracted broiler enterprises in their preference.

In the present study, it was aimed to determine the parameters that are effective in the decision making of the contracted broiler enterprises for the selection of integrated companies by determining the criteria that are effective in these preferences. In this way, factors affecting the decision-making mechanisms of broiler enterprises were determined. However, it is another matter of debate whether an integrated company wants to work with contract broiler enterprises that desire to work with it. Because the agreements in question are based on the mutual consent of integrated and contracted broiler companies, this study evaluated this situation solely in terms of contracted broiler enterprises.

Because the broiler enterprises, included in this study, performed all their commercial activities under a contract with integrated companies, the data obtained in the field were primarily as a result of a reliable recording system. The majority of broiler enterprises, surveyed in the field within the scope of this research, did not hesitate in sharing their data with our research team regarding production, etc.,. In this study, the research subject was explained to broiler enterprises in detail and it was tried to determine how their strategic choices in the broiler sector are shaped.

It has been determined that the AHP model used within the scope of this research can be an important decision support tool for broiler enterprises. In the study, the AHP model was preferred due to its easy comprehensibility and applicability. Decision support tools such as AHP, Topsis, Vikor, Dea, Fuzzy logic have been used alone or in combination in the literature.

Decision support tools such as AHP, Topsıs, Vikor, Dea and fuzzy logic are used in the literature both on their own and in combination with each other. Out of these decision support tools, the advantages of the AHP method are that it provides an easy understanding of content relating to problems, and provides the simplification of complex problems involving more than one person and criteria by structuring them hierarchically. In addition, it allows the evaluation of quantitative and qualitative criteria together, and ensures the testability of the consistency of the decision maker's judgments within the model. The disadvantages of AHP are that it is difficult to create pairwise comparison matrices if there are too many alternatives and criteria, it requires the criteria to be defined very clearly, and that the comparison process takes a long time due to the decision maker being more than one person or group (Subaşi, 2011). Since the number of alternatives and criteria in the present study were limited and the criteria were clearly defined, these disadvantages did not pose a problem. Although, comparison process took a long time due to the number of the decision makers who were included in the study, it did not cause a problem when the project duration was taken into consideration. Therefore, the results obtained in the study suggested that the AHP method is a decision support system that can be used in broiler enterprises.

Within the scope of the research, the strategies in the integrated company preferences of broiler enterprises and the relative weights of these strategies were tried to be determined. Lamsali and Ariffin (2018) conducted a similar study for contracted broiler enterprises affiliated with integrated companies in Malaysia. These authors determined the selection weights of the criteria (1-Reliability, 2-Sharing, 3-Logistics, 4-Input, 5-Price) used by broiler enterprises when choosing an integrated company as 0.406, 0.098, 0.096, 0.168 and 0.232, respectively. In their study, the most dominant criterion was the "Reliability", which corresponds to the timely, appropriate quality and quantity, stable and sustainable service potential of an integrated company.

In the present study, C1 and C2 criteria were determined as dominant and strategic criteria at 0.460 and 0.200 levels, respectively. The criteria of "Export success and long-term production stability (C1)" and

"Success in unexpected crises (C2)" criteria are closely related to the "reliability" criterion, which was determined by Lamsali and Ariffin (2018) as the dominant criterion with a 0.406 selection weight. Similar to the broiler enterprises investigated in the study by Lamsali and Ariffin (2018), the broiler enterprises in the present study strategically preferred to work with integrated companies, which they see as safe harbor in terms of both production stability and crisis management skills.

In this study, the C3 criterion (payment terms and profit criterion) with a selection weight of 0.180 was determined as the third most important criterion. This criterion is closely related to the "Profit criterion", which was the second most important criterion with a selection weight of 0.232 in the studies of Lamsali and Ariffin (2018). Thus, it is noteworthy that financial parameters such as price, payment and profitability fall behind parameters such as reliability and production stability both in the study of Lamsali and Ariffin (2018) and in the present study. The reason for this is the expectation of the broiler enterprises to benefit from smooth transition capabilities of integrated companies that have crisis management skills in the case of crises such as animal diseases, economic crises, export blockages, and Corona epidemic, etc., which unexpectedly encountered in the market.

In the study of Rezaei and Ortt (2013), although the price was expected to be the most dominant criterion among the main criteria in the evaluation of 43 supplier companies, the effect of this criterion having a selection weight of 0.112 was found to be weak when compared to the other criteria. This result indicated that broiler enterprises gave priority to distribution, logistics, quality and trust parameters. The broiler enterprises in the research of Rezaei and Ortt (2013) were not directly connected to an integrated company within the scope of a contract, in other words, broiler enterprises operating independently. In contrast, the broiler enterprises included in the present study were the enterprises that make joint production with the integrated companies under the contract model. However, in both systems, suppliers and integrated companies that offer sustainable quality service and stand out for their reliability with a stable management approach were predominantly preferred.

Rahardjo *et al.* (2017) have reported that the competitive market of broiler businesses in Indonesia is formed by 1-suppliers, 2-customers, 3-potential entrepreneurs, 4-companies, 5-substitute products. Thus, broiler businesses can have an advantage in this competition by introducing new products to the market, reducing costs and increasing promotions. However, this situation is not valid in the contract production model that was investigated in the present study. In the contracted model, commercial strategies such as promotion and introducing new products to the market are made by integrated companies.

According to the results of the present study, the strategies of the contracted broiler enterprises can be listed as: the first strategy was working with a correct integrated company, the second strategy was to obtain quality care and good FCR, and the third strategy was to control the costs of contracted broiler businesses. The ability of broiler enterprises to control their costs affects their profit rates. Apart from these, strategic movements of contracted broiler businesses are limited. This study focused on the priority strategy of contracted broiler businesses, which is selecting the right integrated company and the criteria used here.

According to the criteria considered within the scope of this study, the selection weights of integrated companies were determined as 0.345, 0.367, 0.126 and 0.17 for A, B, C and D integrations, respectively. This result has shown that for broiler businesses, A and B integrated companies are dominant, which are large-scale, institutional-dominated, reliable and promise stability. Among the criteria used in the research, only in terms of the flexibility criterion (C4), C and D integrations had a strategic advantage over other integrations. When the contracted broiler enterprises are not preferred by other integrated companies due to disadvantages such as their geographical location, technical facilities, business scale, etc., C and D integrated companies, which can be contracted with a solution-oriented and flexible approach instead of strict corporate principles, are actually considered as B plans for contract broiler businesses. Here, it should be noted that the contracted broiler businesses were forced to turn to C and D integrated companies due to their current situation.

In their study, Rezaei and Ortt (2013) reported that broiler businesses turned to other suppliers that were weak in terms of ability and willingness criteria when they did not have a situation to work with the suppliers in the 4th group (high talent and high willingness). In this study, contracted broiler enterprises make a choice and move step by step to others, starting with the integrated company that will strategically benefit the most.

In conclusion, the AHP method enabled us to analyze the decision mechanisms of enterprises in the sector on a mathematical plane. This method is a sample road map to support decision systems of broiler enterprises. The results of the present study were consistent with the impressions obtained from the field within the scope of the research and with the results of previous studies.

In the present study, it can be seen that the contracted broiler enterprises primarily adopt the options that promise confidence and stability. According to these priorities, coping with national and global crises can only be sustained with an

effective strategy. The global-scale crises that have emerged in recent years justify the broiler enterprises more than ever to search for stability and confidence more than profit

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