



INCUBATION PROPERTIES OF NATIVE GEESE IN TURKEY

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ABSTRACT

Goose breeding is an important branch of breeding in many countries especially in the USA, China, Poland, France, Bulgaria, and Russia. In Turkey, goose production is performed in the Eastern Anatolia Region, especially in Kars and Ardahan provinces, Central Anatolia, and the Lakes Region is also a significant source for meeting families' meat demand. This research was conducted to identify incubation properties of local geese raised in Afyonkarahisar. In this study, egg weight, shape index, fertilization range, incubation performance, and hatching power were determined. Data was collected from 100 geese eggs obtained from a goose flock that were in the first yield year in a private family business in Nuribey town, Afyonkarahisar. It was found that egg weight was 137.37 ± 9.21 g, shape index was $67.04 \pm 2.94\%$, fertilization rate was 72.00%, incubation performance was 58.00%, and hatching power was 80.55%. This study is important for the evaluation of goose potential in Afyonkarahisar region, it is possible to say that is a race that should be studied especially in terms of fertility rate, hatchability and hatching power.

Keywords: Goose; Egg traits; Hatching traits, Goose egg

1. INTRODUCTION

Although goose breeding is not very widespread in our country, it is preferred in some regions due to its easy breeding. The material in question consists of low-yielding domestic breeds, low production costs and close to natural conditions in terms of aquaculture. It should be considered as a source of business and income by highlighting these advantages. Despite the progress achieved in the poultry sector in Turkey, it produced intensively in many countries and significant export opportunities in terms of their own products, such as feather and goose production of fatty liver could not go forward without a small number of studies done in Turkey. From this point; It is important to carry out different studies on geese that are raised in different regions and to increase the efficiency of artificial hatchability in terms of meeting the needs in this area. As a matter of fact, in a survey conducted in the province of Yozgat, it was found that; breeding, lack of information about feeding, state support and breeding with more productive goose breeds [1,2,3,6].

As a result of interviews with goose breeders in Afyonkarahisar; it was reported that the domestic geese gave 12-15 eggs annually, they started to lay at the age of 9-10 months, in the beginning of February and laying continued until the end of March, the first gosling were generally taken at the end of April.

Researches have shown that the geese potential in Afyonkarahisar is not evaluated adequately and there is no scientific study on geese in the region. In this study, it was aimed to determine the hatching characteristics of geese in Afyonkarahisar region and the data obtained can be used as a reference for further studies.

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2. MATERIALS AND METHODS

The material of this study was composed of geese breeding in Afyonkarahisar province. Geese are the first domesticated animals of the Anser genus from the Anatidae family. Domestic geese are of various colors, appearances and sizes. There are two main types of domestic geese. The first of these is; Geese of European origin and thought to have originated from wild Greylag geese (*Anser anser*). The second one; Geese of Asian origin are accepted to originate from wild Swan geese (*Anser cygnoides*) (21, 22, 23).

One hundred geese eggs obtained in the first fertility year of geese in a private family-run business in Afyonkarahisar were used to be incubated. Obtained eggs were put into incubation machine (Çimuka, CT-180-S) in a week at most after being recorded daily. Gathered eggs were weighted on a precision balance and their weights were determined (0.01 g). Shape indexes of the eggs were calculated after their length and width were measured [9]. Lamp control was performed in order to detect fertility and embryonic deaths on the 10th and 27th days of the incubation. Infertile eggs are removed from hatching machine. The eggs were transferred to hatching machine (Çimuka, CT-180-H) from development machine on the 27th day of the incubation. The incubation conditions of geese eggs are shown in Table 1 [9].

Table 1. Incubation Conditions of Geese Eggs

(Days)	Temperature (°C)	Humidity(%)	Cooling+ water spraying
1-7	37.7	58	
8-10	37.7	58	5 minutes cooling+ water spraying
10	37.7	58	1. 1 st control
11-14	37.7	58	5 minutes cooling+ water spraying
15-21	37.7	58	15 minutes cooling+ water spraying
22-27	37.7	58	25 minutes cooling+ water spraying
27	37.7	58	2 nd control and transfer
28-30	37.2	76	

Statistical analysis of egg weight and shape index values were evaluated by using t-test with SPSS program, and values of fertility rate, hatchability, and hatching power were calculated in accordance with the formulas below [8,7,1].

Shape index, % = the width of egg (mm) / the length of egg (mm) x 100

Fertility rate, % = the number of fertilized egg / total number of eggs in incubation x 100

Hatchability, % = the number of hatching chicks / total number of eggs in incubation x 100

Hatching power, % = the number of hatching chicks / the number of fertilized egg x 100.

3. RESULT AND DISCUSSION

The results related to the incubation properties, shape index, and egg weight of the eggs gathered from 1 – year – old geese bred in Afyonkarahisar province are seen in Table 2.

Table 2. Egg weights and shape index of the eggs gathered from 1 – year – old geese.

Properties	n	Goose eggs	$\bar{X} \pm S\bar{x}$
Egg weight (g)	100	137.37±9.21	
Shape index (%)	100	67.04±2.94	

In this study, fertility rate (%) is 72.00, hatchability (%) is 58.00, hatching power is 80.55 was found.

In this study, determined egg weight (137.37 g) from the local geese in Afyonkarahisar was lower than the egg weight of INRA (156.19±1.30 g), Armutlu (176.67±2.08 g), Başkuyu (156.44±2.42 g) and Tatlıcak geese in the study [10], and the egg weight value of 3-4 – year – old local geese with different feather colours (Black, White, Pied and Yellow - 147, 150.49, 142.95, and 150.88 g, respectively) as stated by Saatçi et al (2005). It was higher than the egg weight (128.85±2.03 g) of 1 – year – old geese in Kars province as stated [5], but lower than the egg weight (148.15±3.76 g) of 2 – year – old geese. Determined egg weight value in Afyonkarahisar was among the egg weight (130 – 150 g) determined in INRA geese in the first egg laying [11]. It can be said that the reason of having lower egg weight values in the present study than in many other studies is that the geese from which the eggs were gathered were in their first egg laying season. It is stated that the egg weight increases in accordance with the increasing age [1,5,6,10,11,17]. The differences in terms of egg weight can be due to the age, genotypic differences, live weight, and environmental conditions.

Shape index of local geese determined as 67% in Afyonkarahisar province is lower than the value (68.3%) stated by Tilki and İnal (2004) and higher than the shape index value stated as 66.27% in Turkish local geese [17], and also higher than the value (65.11%) stated [12]. The egg shape index of Afyonkarahisar local geese (67.04±2.94%) was close to the egg shape index values (67.01, 66.19, 66.68, and 67.12%, respectively) of the geese with different feather colours (Black, White, Pied, and Yellow) stated [5].

In this study 72% fertility rate has been found and compared to the other research. The results are showed that Afyonkarahisar local geese were higher than the other breeds. The other researchers results which are 71.7%, 60%, 62.97%, 71.43%, 72,37%, 76.74%, 61-72%, 42.54%, 47.25% [12, 1, 14, 5]. As a known hatchability rate is a important parameter which is depends on fertility rate. Fertility rate especially has been highly effected by male/female of flock and nutrition factors (14, 19).

Hatchability determined as 58% for Afyonkarahisar local geese was higher than the values (9.38%, and 29.73%) stated [4]. It was also higher than the hatchability of Armutlu, Başkuyu, and Tatlıcak geese (56,90, 54,72 and 57,14 %, respectively) as stated [1]. It was similar to the hatchability values (58,30%) of 1 – year - old Bilgoraj geese as stated [16]. Hatchability values obtained from the study were higher than many local geese hatchability values. It can be a different race and further analysis is needed to understand this feature. The differences in the hatchability values in the studies; fertility rate, genetic structure, nutrition, storage conditions of eggs [4,19].

Hatching power determined as 80.55% for Afyonkarahisar local geese was higher than geese in Kars and Aksaray province (24.73% and 10,6%, respectively), and it was also higher (58-63%) than hatching power average of three genotypes in Poland [6,18,4]. It was similar to the hatching power for Armutlu, Başkuyu, and Tatlıcak geese eggs (76.74, 80.56, 80%) in the study conducted [1] and lower than the hatching power of INRA geese (84.91%). Differences in hatching power values are mainly due to hatching errors or conditions, as well as storage conditions. The differences in cooling, water spraying, temperature, humidity and turning processes are effective during incubation [9,20].

4. CONCLUSIONS

In the researches, it was found that the geese potential in Afyonkarahisar province could not be evaluated sufficiently and there was no scientific study on goose breeding in this region. In this study, especially the fertility rate, hatchability, and hatching power properties of Afyonkarahisar local geese are higher than many other local geese races. After this study; several of the recommodation is decreasing mortality in during the hatching.

- Goose breeder have to develop to using machine for hatching.
- Before using machine hatching technique, researcher have to investigate deeply and use advantages of machine hatching technique. Thus, more goose chick can be achieve Our study has shown that; Similar results have been obtained in this research.
- According to these results, it is important that the goose breeders have the necessary information about the use of the machines, their features and the issues they should be aware of before using the incubator. In particular, it will be useful to obtain technical support on hatching humidity, temperature, cooling and water spraying. These results may indicate a different race than other known races, and further analysis are needed to understand it. As the hatching features are higher than in other places, these geese from Afyonkarahisar can be replaced and preferred to increase the production.

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