

RESEARCH ON INCUBATION INDEX OF THE EGGS PROVIDED BY GRAY GUINEA FOWL *NUMIDA MELEAGRIS*

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Abstract

Nowadays, the prevention of diseases through a healthy diet for modern society is becoming a matter of major interest, from a socially, economically and politically point of view.

In this context, the objective of the research was to evaluate the incubation index recorded by eggs provided by gray guinea fowl, reared in both extensive and intensive system. A number of features were investigated regarding the clarity of the eggs, the percentage of fertility, the number of eggs with dead embryos, the percentage of hatching.

The data regarding the clarity of the eggs show us for the extensive system values between 24.39% (batch 2) and 29.97% (batch 3), and for the intensive system the values were in the range 9.76-14.63 %. Regarding the fertility of the analyzed eggs, it exceeded the threshold of 70% in all batches from the extensive system; for intensive system eggs, fertility was over 85%. The highest embryonic mortality was recorded in batch 1 (24%), and the lowest in batches 4 and 5 (15%). Regarding the hatching of eggs, the results recorded ranged around 65% for the extensive system and 80% for the intensive system. The hatchery percentage shows us for the extensive system values between 43.90% (batch 3) and 51.22% (batch 2). The intensive system was highlighted with much higher values, more precisely batch 4 with a hatching percentage of 73.17%, batch 5 with a percentage of 70.73%, and batch 6 with a value of 70.73%

Guinea fowl eggs have a number of very valuable biological properties, so the extensive exploitation of these birds can have great prospects for development.

Key words: guinea fowl, incubation, hatchery, index

INTRODUCTION

Poultry farming had a fabulous development in the second half of the 20th century, that continues even today.

This development has been correlated with various demographic, historical and economic situations and events.

With the increase of the global population, there has also been an increase in demand for animal products, poultry and eggs being a very important source of protein, an advantage being the speed with which it is produced compared to that from other species.

Market studies have shown that eggs occupy a special place in human nutrition, being a rich source of nutrients needed by the body and with a high biological value [1].

Currently, more than 200 breeds of animals are reared, coming from different systematic classes, their transformation from wild animals into "cultured" animals persists even today [2].

When consumed in a balanced way, eggs can be a real metabolic stimulant but also a vector of resistance to disease [3].

Guinea fowls, along with quails and partridges, have only been reared for a few decades for meat and egg production. The gray guinea fowl (*Numida Meleagris*) is the most common in Romania, its growth being carried out exclusively in the household system.

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MATERIAL AND METHODS

The biological material was represented by 246 guinea fowl eggs harvested from gray guinea fowl (*Numida Meleagris*).

The analysis were performed on eggs harvested from guinea fowls reared both extensively and intensively and came from 6 private households. To facilitate the presentation of the data, the batches were numbered as follows: batch 1 (L1), batch 2 (L2), batch 3 (L3), batch 4 (L4), batch 5 (L5), and batch 6 (L6).

During the research, the indicators followed were the clarity of the eggs, the percentage of fertility, the number of eggs with dead embryos, the percentage of hatching.

Fertility was calculated as the percentage ratio between clear eggs and hatching eggs by applying the relationship

$$F (\%) = 100 - \left(\frac{O.L}{O.I} \times 100 \right)$$

The percentage of dead embryos will be expressed based on the ratio between the number of dead embryos at mirage I and the number of eggs introduced to incubation according to the relation:

$$E.M.M. I(\%) = \frac{E.M.M. I}{O.I} \times 100$$

Hatchery is the percentage ratio between the total number of viable chicks and the number of fertile eggs and is determined

$$Hatchery (\%) = \frac{T.P.V.}{O.F.} \times 100$$

Hatching is the percentage ratio between the total number of viable chicks and the number of incubated eggs and is determined according to the relation

$$Hatching (\%) = \frac{T.P.V.}{O.I.} \times 100$$

The data obtained were statistically processed, calculating: average, variance, standard deviation of the average, coefficient of variability using ANOVA software.

RESULTS AND DISCUSSIONS

The clarity of the eggs. From the analysis of the results it is observed that between the 2 batches there are differences regarding the number of infertile (clear) eggs. Thus, in the first batch, the number of clear eggs was 11, which corresponds to a percentage value of 26.83%, for the 2nd batch, the value was 24.39%, precisely 10 eggs, and at the 3rd batch analyzed, 12 clear eggs were observed (29.27%).

For the eggs harvested from guinea fowls reared in intensively system, the situation is better. Specifically, batch 4 presented a number of 5 clear eggs (12.20%), batch number 5 had 6 clear eggs corresponding to a percentage of 14.63%, and batch number 6 had only 4 clear eggs, that is 9.76% (Table 1).

Table 1 The number of eggs introduced and their clarity

Batch	Number of eggs		Clarity	
	n	(%)	n	(%)
L1	41	100	11	26.83
L2	41	100	10	24.39
L3	41	100	12	29.27
L4	41	100	5	12.20
L5	41	100	6	14.63
L6	41	100	4	9.76

Eggs fertility. The fertility values in the first batch were 73.17% (30 fertile eggs), for the second batch, the value was 75.61% (31 fertile eggs), and in the last batch of eggs harvested from guinea fowls reared in an extensive system showed a value of 70.73% (29 fertile eggs). Batch 4 recorded a

percentage of 87.80%, which corresponds to a number of 36 eggs, batch number 5 had 35 fertile eggs (85.37%), and the best fertility was highlighted in batch 6, namely 37 eggs, 90.24% fertility rate (Table 2).

Table 2 Fertility of eggs

Batch	Fertility	
	n	(%)
L1	30	73.17
L2	31	75.61
L3	29	70.73
L4	36	87.80
L5	35	85.37
L6	37	90.24

Embryonic mortality. From our study, following the analyzes, it was found in the case of the first batch, a value of embryonic mortality of 24.39%, which corresponds to a

percentage of 75.61% viable chickens; in the case of the second group, the value was 17.07% embryonic mortality, 82.93% viable chickens, and for the last group studied, 21.95% embryonic mortality with 78.05% viable chickens.

Better values were found in the eggs from the intensive system, more precisely batch 4 and 5 had an embryonic mortality of 15%, 85% of the chicks were viable, and batch 6, 20% embryonic mortality, 80% viable chickens (Figure 1).

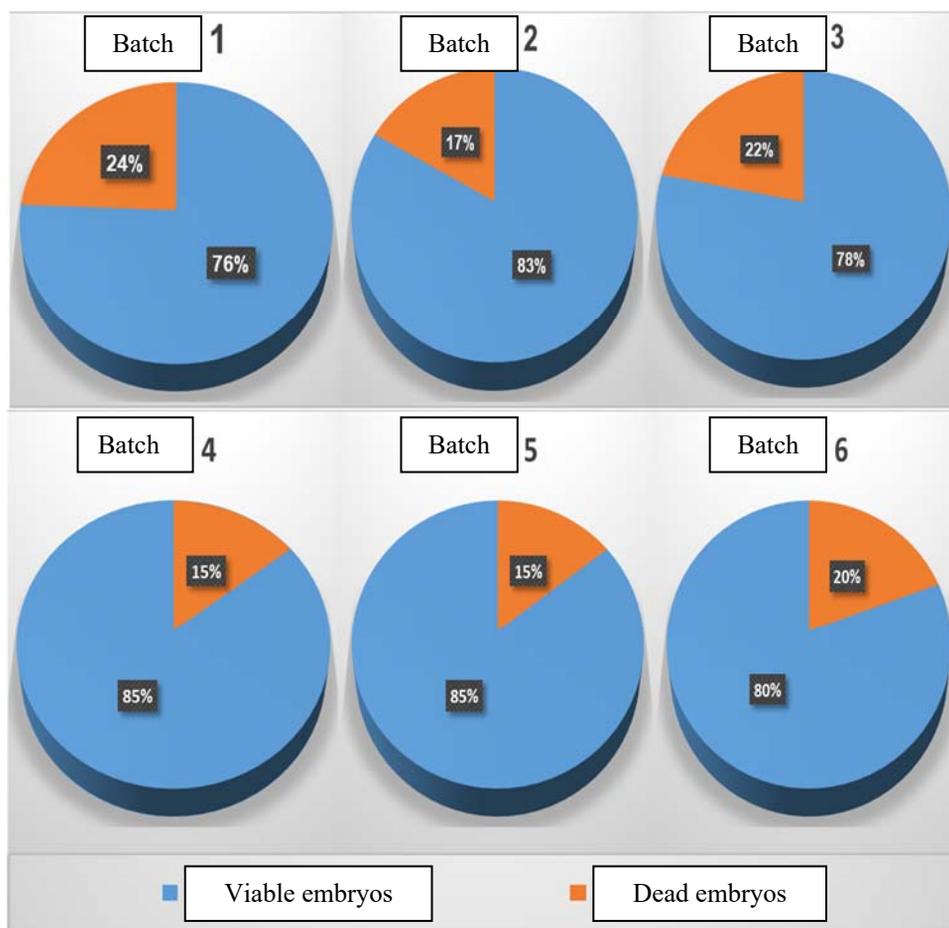


Fig. 1 Embryonic mortality of eggs harvested from guinea fowls reared in extensive system

Hatchery of the eggs. At the end of the incubation, the following values were obtained in terms of hatchery: for batch L1, there were

a number of 20 chicks, 66.67%, for batch L2, there were 21 chicks corresponding to a percentage of 67.74 %, and from the last batch

L3, 18 chicks were obtained, 62.07% Much better results were obtained by batches of eggs harvested from guinea fowls reared in an intensive system. Batch 4 had a hatchery percentage of 83.33%, which corresponds to a number of 30 chicks, batch 5 a percentage of 82.86%, 29 chicks, and batch 6 had a hatchery percentage value of 78.28%, 29 chicks hatched (Table 3).

Table 3 The hatchery percentage

Batch	Hatchery of the eggs	
	n	(%)
L1	20	66.67
L2	21	67.74
L3	18	62.07
L4	30	83.33
L5	29	82.86
L6	29	78.38

Hatchability of the eggs. The highest value regarding the hatchability of eggs from the extensive system was obtained in the second batch, 51.22%, followed by the first batch with 48.78% hatching, and finally the last batch L3, with 43.90% hatching.

For the intensive system, the situation is much different, more precisely batch 4 with a hatching percentage of 73.17%, batch 5 with a percentage of 70.73%, and batch 6 with a value of 70.73% (Figure 2).

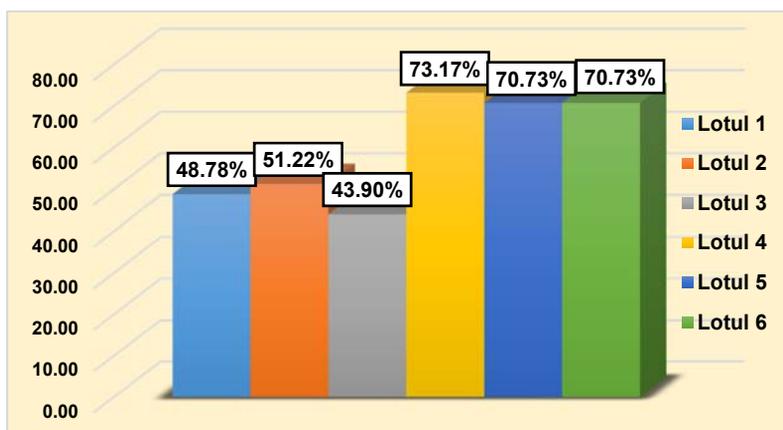


Fig. 2 The hatchability of the eggs

CONCLUSIONS

Yakubu (2019) obtained a lower percentage of fertility (55.97%) than the one resulting in our experience (70.73-75.31%). Likewise, Ayorinde (1989) and Mwale (2008) obtained 50% and 59% value of egg fertility, respectively. A slightly higher result was found in the study of Premavalli (2013) with the value of 62.89%. The data on embryonic mortality recorded by us show values close to those specified by Premevali (2013) by 21.74%.

Following the research, we recommend the incubation of eggs provided by guinea fowls reared in intensive system, because great results can be obtained in terms of hatching.

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