STUDY ON THE INFLUENCE OF THE INCUBATION EGGS KEEPING POSITION DURING STORAGE AND THEIR OLDNESS ON HATCHING RESULTS OF THE BALOTESTI QUAILS POPULATION

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Abstract

In order to determine the effect of position of eggs during storage and their oldness on hatching results, an experiment was organized on a total of 1,800 incubation eggs of Baloteşti quails population. For this purpose, the incubation eggs were collected for 6 days and kept on average temperature of 15°C and average relative humidity 75%, of which 900 were kept with the tip pointed down and 900 were kept in a horizontal position.

As a result of the carried out research, it was found that the batch of eggs preserved with the tip pointed down during storage has registered an average hatching percentage of 74.66%, with 14.00% higher that the batch of eggs kept in a horizontal position (60.46%). Also, in the batch of eggs kept with the tip pointed down during storage, there was a percentage of weight loss with 2.02% lower and the rate of weight loss during incubation with 3.86 percent lower in the experimental batch compared to the percentage of weight loss recorded by the batch of eggs kept in a horizontal position. Regarding the age of the eggs, was found that the best results were recorded from eggs with length preservation of 4 days in both batches of eggs, while the freshest eggs, with oldness from 1-3 days, hatches began early, since the 15th day of incubation, and the eggs with higher oldness, of 4-6 days, hatches unfolded in almost equal proportion in day 16th and 17th of incubation.

Key words: quail, eggs, storage, incubation, hatching

INTRODUCTION[1]

Intensive growth of quails is still a limited activity in Romania, being more grown quails raising segment at the household level, aspect less positive because the system used may not apply and comply with the principles of modern farmsteads, so as regards the activity of breeding and hatching and raising of the youth and adult quails. From this point of view, the storage of hatching eggs constitutes a major problem because at the quail is not known the effect of various factors during storage and specialized systems are not used during storage of the eggs. Most breeders keep their eggs in a horizontal position.

In the case of chicken eggs, the most advisable positioning of eggs during their storage is vertical, with the tip pointed down, while returning the eggs during storage do not entail an improvement in results, with the exception of hatching eggs stored for longer time [1].

Egg weight loss during hatching is an important parameter for the incubation of eggs [7] and was correlated with embryo's metabolism and its development [10]. Weight loss percentage of hatching eggs during storage is influenced by temperature and level of humidity during its [9]. A too low or too high percentage of weight loss during storage influences embryonic development during incubation [8] and consecutive hatching percentage [5].

[1] states that, in the case of chicken eggs, hatchability decreases as the duration of storage of eggs between harvesting and their introduction at the hatchery increase, and in normally temperature and humidity conditions, hatchability decreases with approximately 1%-1.4% day of storage.

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MATERIAL AND METHOD

The researches were conducted under quails farm Gherghiţa, society Ioniţă T. Lucian, Bucharest individual enterprise, on a total of 1,800 hatching eggs divided into two groups depending on the position of preservation during storage: 900 eggs were kept in position with the tip pointed down (experimental batch), and 900 were kept in a horizontal position (the control batch). Maximum length of eggs age on both batches was 6 days, every day with the insertion of an equal number of eggs to incubation, in surface incubators, small type Cleo 5. The eggs were incubated in a horizontal position and turned twice a day on both batches.

The environmental conditions in which was conducted researches on storing were within those provided by specialty literature (average temperature during storage was 10°C and average relative humidity of 75%).

Data processing was performed using Microsoft Excel 2007, and testing the differences was performed using the Student test.

RESULTS AND DISCUSSIONS

1. Evolution of the average percentage weight loss of eggs from the two batches during the six days of storage

During storage of eggs from the two batches was recorded an average daily loss of 0.59 ± 0.03% in the control batch and 0.43 ± 0.02% of the other; differences between the two batches is significant. Total weight loss during storage was 3.57% for the control batch and 2.55% in experimental batch.

Table 1 The average daily percentage of total weight loss during storage and incubation of eggs of the two batches

Specification	The control batch (%)	Experimental batch (%)
The average daily percentage of total weight loss during storage (6 days)		
X ± Sx	0.59 ± 0.03*	0.43 ± 0.08*
Total	3.57 %	2.55 %
The average daily percentage of total weight loss during incubation (15 days)		
X ± Sx	3.72 ± 0.35*	2.76 ± 0.09*
Total	14.88 %	11.02 %

**t=2.02, significant differences*

Daily average percentage of weight loss during incubation in the control batch was 3.72% ± 0.35, while the experimental batch was 2.76% ± 0.09, the differences being significant. Total weight loss during incubation was 14.88% for the control batch and 11.02% for experimental batch.

Lacin E et al. (2008) determine a total percentage of weight loss during storage of 1.44% in the case of eggs stored for 1-3 days and 1.99% of eggs stored for 6-8 days, similar to those in this experiment, [4].

In an experiment conducted to establish the effect of high temperatures during storage of the Baloteşti population of quails eggs, [3] have determined the following average percentages of weight loss during storage of eggs kept in a horizontal position: 1.09% on day 6, 0.69% on day 5, 0.51% at day 4, 0.38% at day 3 and by 0.08% at day 2 and day 1. The average percentage of weight loss per day of storage was 0.47% and the total weight loss during storage was 2.82%, rates comparable to those in this experiment.

Using the same type of incubator, the authors determined an average weight loss during incubation of 12.79%, a percentage comparable to those in the batches analyzed in this experiment.

2. The average results obtained in incubation of eggs from the two batches

The average percentage of hatching eggs from the control batch was 60.46% ± 4.49, while experimental batch was 74.66 ± 2.87%, the differences being very significant.

For the control batch, the highest percentage of hatching was recorded in eggs stored for 5 days (66.55% ± 3.45), the lowest percentage of hatching being recorded from eggs stored for 2 days (57.33% ± 2.38).

In the experimental batch, which were recorded superior results than the control batch, the highest percentage of hatching was recorded also at eggs stored for 5 days (78.75 ± 3.26%), the lowest percentage of hatching registering on eggs stored for 2 days (71.33 ± 2.88%).

Table 2 The average results obtained from incubation of eggs from the two batches

Specification	The control batch						Experimental batch					
	X ± Sx											
	Day of storage						Day of storage					
	1	2	3	4	5	6	1	2	3	4	5	6
The average percentage of hatching (%), d.c. :	60.46 % ± 4.49***						74.66 ± 2.87***					
	58.75 ± 1.56	57.33 ± 2.38	58.34 ± 2.26	60.45 ± 2.75	66.55 ± 3.45	61.33 ± 1.97	75.65 ± 1.26	71.33 ± 2.88	74.67 ± 2.16	75.35 ± 3.54	78.75 ± 3.26	72.25 ± 2..12
- Day 15	8.00	9.50	5.45	-	-	-	9.00	10.00	7.35	-	-	-
- Day 16	55.00	56.00	60.45	65.23	58.95	55.50	50.00	55.00	58.55	60.55	57.85	58.50
- Day 17	37.00	34.50	34.10	34.77	41.05	44.50	41.00	35.00	34.10	39.45	42.15	41.50
The average percentage of dried eggs (%)	2.89 % ± 0.94ns						2.42 % ± 0.82ns					
	2.00	3.00	5.45	1.95	1.25	3.69	1.34	1.22	4.61	2.58	1.25	3.55
Average percent of clear eggs (%)	20.66 % ± 1.35***						11.60 % ± 2.17***					
	20.72	23.45	18.86	21.85	18.65	20.45	10.45	16.00	9.95	12.31	10.46	10.45
The average percentage of dead in shell chickens eggs (%)	15.98 % ± 1.34***						11.31 % ± 1.10***					
	18.53	16.22	17.35	15.75	13.55	14.53	12.56	11.45	10.77	9.76	9.54	13.78
Egg initial weight (g)	11.61 ± 0.45ns						11.44 ± 0.55ns					
	11.52 ± 0.98	11.45 ± 1.03	11.23 ± 0.86	11.88 ± 0.96	11.67 ± 0.77	11.88 ± 0.67	11.36 ± 1.13	11.23 ± 0.68	11.32 ± 0.89	11.55 ± 0.98	11.75 ± 0.97	11.44 ± 1.15
The average chicken weight of 1 day old	8.36 ± 0.08**						8.59 ± 0.12**					
	8.25 ± 0.78	8.67 ± 1.12	8.65 ± 0.97	8.15± 0.94	8.23 ± 0.85	8.22 ± 1.06	8.56 ± 0.65	8.70 ± 0.58	8.60 ± 0.75	8.67 ± 0.69	8.55± 0.95	8.45± 1.05
Share of average chicken weight at 1 day old from the initial weight of the egg	72.11± 4.96ns						75.08 ± 1.09ns					
	71.61	75.75	77.00	68.60	70.53	69.20	75.35	77.47	76.00	75.06	72.77	73.86

****t=4.56,* very *significant differences; **t=2.22, distinctly significant differences.*

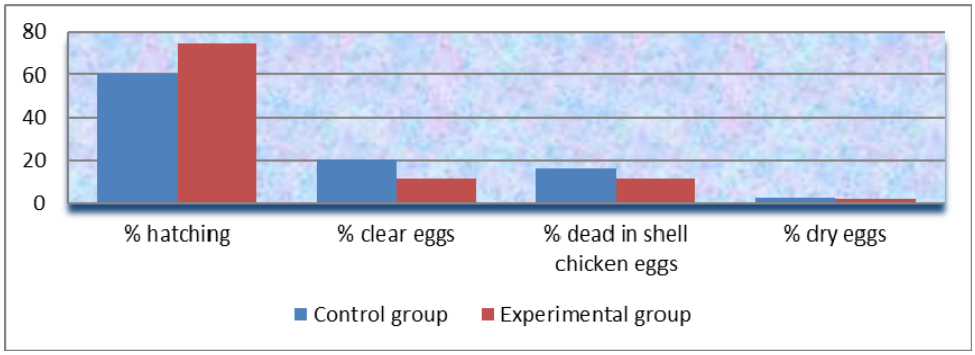

Fig. 1 The average hatching results in the two analyzed batches of eggs

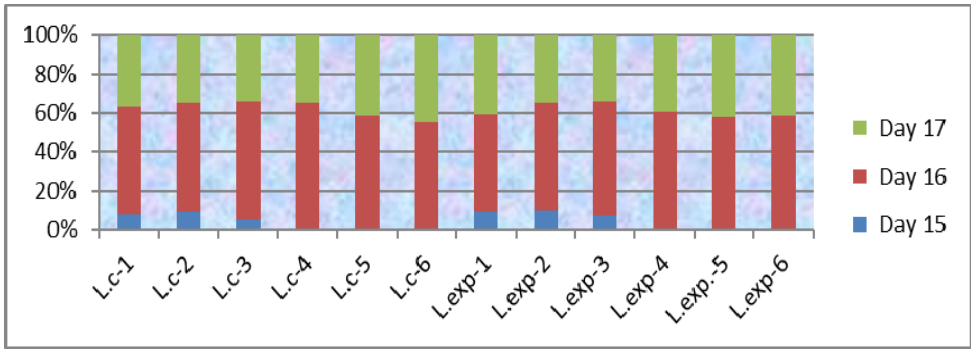

Fig. 2 Average daily percentages of hatching eggs in the two batches analyzed

In a study conducted in Brazil by [6], they have determined an average hatching of 77.3% for eggs incubated horizontally, with returning, a percentage close to that recorded in the experimental batch in this experiment, of 74.66% (especially eggs stored for 5 days from experimental batch, where the average percentage of hatching was 78.75%).

Lacin E et al. (2008) determine an average of 65.40% of total fertile eggs for eggs by age of 1-3 days and 48.70% for eggs by age 6-8 days, [4].

In an experiment conducted to establish some parameters hatching quail using the same type of incubator and keeping the eggs horizontally for 6 days, [2] determined the average percentages of hatching between 64.67%, an average of clear eggs of 16.22%, an average percentage of dead chickens in the shell of 16.89% and an average percentage of dried eggs of 2.22%, comparable results to the present experiment.

In the eggs from 1-3 days of storage, hatch began in the 15th day of incubation in both groups (between 5.45% and 10%), while in both groups hatching occurred mostly on day 16 of hatching (over 50%). 17th day of incubation were registered hatching percents between 34.10% and 44.50% for the control group and between 34.10% and 42.5% for the experimental group.

The average percentage of eggs with dead in shell chickens in control batch was 15.98% ± 1.34, while the experimental batch was 11.31% ± 1.10; the difference between the two batches is very significant.

The average percentage of clear eggs in control batch was 20.66% ± 1.35, while the experimental batch was 11.60% ± 2.17; the difference between the two batches is very significant.

Average percentage of dried eggs during incubation in control batch was 2.89% ± 0.94, while the experimental batch was 2.42% ± 0.82; the difference between the two batches was not significant.

Egg initial weight in control batch was 11.61 ± 0.45 g, while the experimental batch was 11.44 g ± 0.55; the difference between the two batches was not significant.

The average weight of the 1 day old chicken in control batch was 0.08 ± 8.36 g, while the experimental batch was 8.59 g ± 0.12, the difference between the two batches being distinctly significant.

The share of the average weight of 1 day old chicken from the initial weight of the egg in control batch was 72.11 ± 4.96%, while the experimental batch it was 75.08 ± 1.09%, the difference between the two batches being not significant.

CONCLUSSIONS

The percentage of weight loss during storage was lower by 2.02%, and the percentage of weight loss during the incubation period was 3.86% lower in the experimental batch compared with the control batch, the differences being significant.

The percentage of hatching was significantly higher (by 14.14% higher) for the batch of eggs that were stored for 6 days, with the tip pointed down, compared with the batch of eggs stored for 6 days in a horizontal position. Also, the percentage of clear eggs and percentage of eggs with dead in shell embryos were significantly lower in the experimental batch compared with the control batch (10% for the clear eggs, respectively 4.67% for eggs with embryos dead in shell).

In both batches analyzed, hatching started in day 15 of incubation for eggs that the storage period was between 1 and 3 days, while the highest percentage of hatching was recorded in eggs stored for 5 days.

As a result of research we can say that the position of storage the eggs of quail significantly influences the results of incubation and, from this point of view, we recommend storing the eggs with the tip pointed down.

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