

Comparative Development Indicators of Partridge Chicks (Alectoris Chukar) During Cell Breeding

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ABSTRACT

The paper presents experimental data on the negative impact of negative biotic and abiotic factors on the development of stone partridges (*Alectoris chukar*) in vivarium conditions, the identification of optimal terms and conditions for growing young partridges in cages in vivarium conditions and in aviaries. In the first 30 days after the transfer of partridges to aviaries, the average daily gain of both cell and aviary was almost the same. From day 31 to day 41, the gain in weight of the partridge mass contained in the vivarium in cages was 5.8–12.0 g lower than that found in the enclosures. All partridges from 31 to 41 days had the same rate of weight gain, but from 31 to 41 days, the gain in partridges in the vivarium increased compared to the weight gain in aviary. Thus, the influence of negative conditions on the development of young partridges of domestic fauna was revealed. It was experimentally established that the life span of partridges for the 13 and 25-day growing periods reached 96% and 97%, respectively. At the same time, the life span of partridges where, along with heating, was also irradiation of the room with ultraviolet and infrared radiation for a 13-day period of cultivation, reached 100% of the value.

KEYWORDS: Partridge, *Alectoris Chukar*, Breeding, Weight Gain, Ultraviolet Radiation, Infrared Radiation

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INTRODUCTION

In a number of foreign countries, the artificial breeding of local stone partridge (lat. *Alectoris chukar*) has been put on an industrial basis, due to which it was possible to sharply increase the density of birds in the land. So, in Czechoslovakia annually more than 300 thousand partridges are released into the land (Kuznetsov, 1972; Sapetina, 1970) and it is up to 180 birds per 100 hectares. Great successes were also achieved in France, Bulgaria, Hungary, Yugoslavia, where not only the domestic needs of hunters were satisfied, but many chicks and eggs were exported to other countries [1,2].

In addition, the method of cage keeping is widely used in the cultivation of different types of fowls. The need for its use was caused, first of all, by the desire to provide the best zoohygienic conditions for birds, since birds, especially young animals, are prone to diseases when they are kept in open-air cages and constantly in contact with the soil, the main diseases of which are syngamiasis, histomoniasis, coccidiosis [3, 4].

Keeping chickens in small cages during the year can lead to atrophy of the heart, liver, and muscular stomach [5,6].

The normal development of partridge chicks grown under artificial conditions is largely dependent on feeding. In order to timely provide the bird with a full ration, it is necessary to find out the dynamics of its growth and development. One of the methods for studying bird growth is the analysis of its weight and linear changes [7].

Growing a healthy bird is possible by organizing proper nutrition and optimal living conditions from the first day [8].

It was found that embryos developing under a thermocontrast mode of incubation had a more developed vascular system than embryos growing under thermostable conditions. The data obtained indicate the possibility of prolonging the viability of the quail embryo by short-term periodic exposure to elevated temperatures, which is not only theoretical, but also of some practical importance when applying the industrial method for artificial incubation [9]

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One of the important issues in modern poultry farming is increasing the viability of birds at different stages of its development. The specificity of poultry ontogenesis is that the development of the embryo occurs outside the maternal organism in the environment, which affects the embryos by unfavorable abiotic and biotic factors (temperature, humidity, toxicants, etc.) [10].

Researches have been conducted to study the histogenesis of the esophagus of the Chukar partridge. For this, eggs with embryos were placed in an incubator, and embryos were collected between 5 and 24 days of the incubation period. Samples were fixed in Bowin's solution, and routine histotechnical processes were performed. During 5-24 days of incubation, events, such as changes in the epithelium of the esophagus, the formation of the mucous membrane of muscles and muscle, the development of mucous glands and the type of secretion were observed in the development of the esophagus. Finally, the results were compared with the results of other studied bird species, similarities and differences were discussed [11].

Chukor or Chukar partridge (*Alectoris chukar*) - fowl of the family Phasianidae. The results show that the breeding season of the species begins in February: peak breeding months are March and April, during which frequent calls were heard. The frequency of calls ranged from 0.15 to 0.3 per minute. Hatching success was up to 85% (from 75 to 85%) in different nests. It is concluded that the breeding season of the Chukar partridge begins in February and lasts until July with successful nesting, egg-laying and hatching [12,13]

In Chukar partridge, the population trend is stable, and the abundance is also extremely high (Bird Life International, 2016). The authors calculated that its number in the world totals s. 2 000 000. Nevertheless, there are reports of a decrease in its settlement in some parts of the world, for example, in Europe, and it is estimated that a small settlement is decreasing at a rate approaching 30% in 11.7 years (three generations) [14, 15].

Thus, special studies are needed to develop technology for the artificial breeding of the local subspecies of partridge. The normal development of partridge chicks (lat. *Alectoris chukar*), cultivated under artificial conditions, largely depends on feeding. In order to timely provide the bird with a full ration, it is necessary to find out the dynamics of its growth and development. One of the methods for studying bird growth is the analysis of its weight and linear changes.

Based on the foregoing, the aim of our research was to identify the negative impact of negative biotic and abiotic factors on the development of partridges in vivarium conditions, to identify the optimal terms and conditions for growing young endemic subspecies of domestic partridge fauna in cages in vivarium conditions.

MATERIALS AND METHODS

All partridges were hatched in an incubator and then placed in cages in a vivarium. We studied the rates of growth and development of partridges on 24 chicks of one brood when growing them in cages. The first 10 days of the chicks were weighed daily, from the 11th to the 25th – every other day, from the 26th to the 60th day - once a week and then - once a month.

When conducting comparative experiments on the cage keeping of partridges, young animals were labeled with dye. We conducted experiments in the summer. We observed equal feed regimes and conditions of keeping (control).

The experimental groups of partridges were divided into two groups: the first group of partridges was kept only in vivarium conditions, and the second group of partridges was placed in aviaries after a 3-week development.

Immediately after hatching, young partridges, 5 animals in a group, were placed in cages (groups 1 and 2). Cage floors were covered with burlap, strewn with sawdust, we put water and gave food. The cells were heated by electric 100-watt lamps. After 13-25 days, part of the partridges in a number of 5 were placed in aviaries (groups 3 and 4), and part of the partridges were left in the cages under vivarium conditions. Feeders and drinking bowls were placed inside the cages and inside the aviary. Heating of the cages turned out to be insufficient, many chicks fell ill with pneumonia, therefore, we simultaneously used infrared and ultraviolet installations.

Partridges were fed with a different diet, with heating the vivarium cages and at the same time exposing the room to ultraviolet radiation.

RESEARCH RESULTS AND DISCUSSION

The development of young animals grown under different conditions was studied by measuring individual parts of the body, monitoring the total weight of birds, health status and vitality. The data obtained are given in table 1.

The first group of partridges, where heating without UV treatment was performed, turned out to be less viable than the second group of partridges, where, along with maintaining the temperature regime, the premises were treated with ultraviolet and infrared radiation.

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Table 1. The dynamics of the mass of chicks

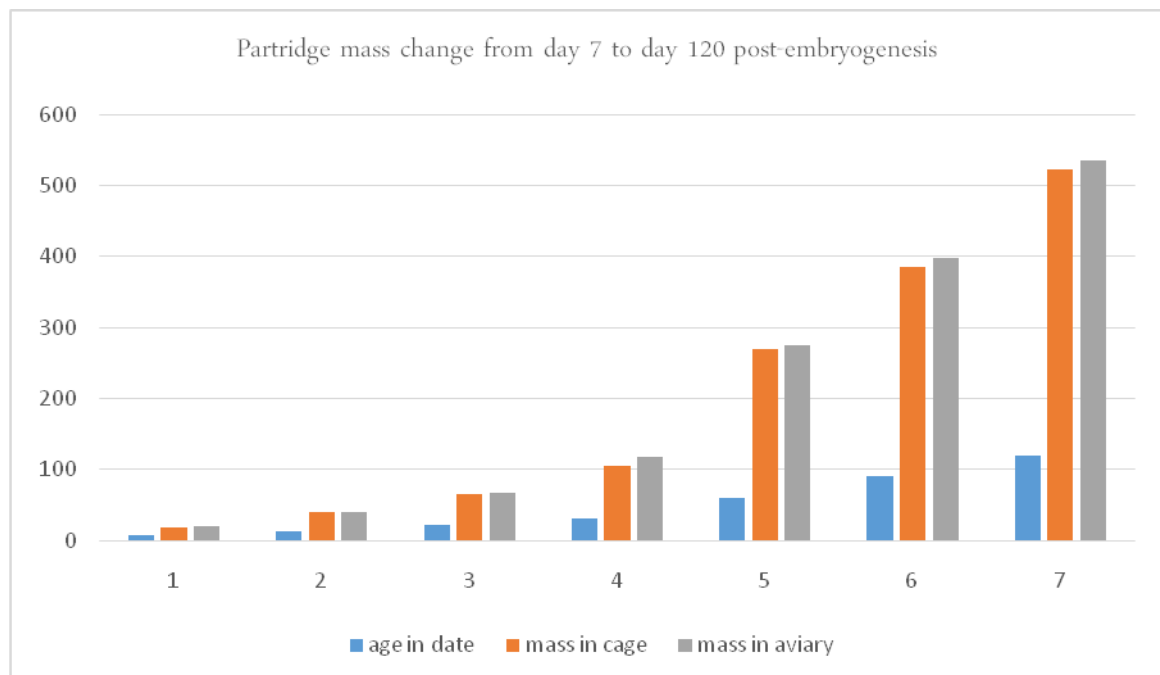
Age in days	Average weight in grams	Age in days	Average weight in grams
After hatching	9.5	22	67.5
3	10.5	25	89.5
4	12.3	28	110.0
5	15.1	31	117.8
6	17.5	35	132.5
7	19.2	40	169.1
8	22.3	45	200.5
9	25.6	50	230.4
10	32.0	55	245.8
13	40.5	60	269.5
16	45.5	90	397.5
19	60.8	120	534.5

For heating electric 200-watt light bulbs were used. The source of ultraviolet radiation was ultraviolet and infrared sources (lamps). The life expectancy of partridges of the first and second groups for the 13-day period of cultivation reached 96% and 97%, respectively.

The safety of partridges of the 3rd and 4th groups (where, along with heating was also irradiation of the room with ultraviolet and infrared radiation) for a 13-day period of cultivation reached 100% of the value.

Partridges, placed after 3 weeks in a vivarium in aviaries where houses were installed, covered with burlap and sprinkled with sawdust, and sources of ultraviolet and infrared lighting were installed in front of the houses (fig.1.).

It is necessary to pay attention to the food of partridges. In the food of partridges, proteins containing amino acids were contained. For feeding, dairy products, crushed fish products, previously boiled, were used.



It should be noted that all partridges in the selected conditions in the aviaries were fed with an identical ration of food. Partridge viability in aviaries reached 100%.

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Таблица 2. Partridge mass change from day 7 to day 120 post-embryogenesis

	Age in days	Conditions of keeping	Indicators
			Mass, g
partridge	7	cage	18.5
		aviary	19.2
	13	cage	39.1
		aviary	40.5
	22	cage	66,1
		aviary	67,5
31	cage	105,5	
	aviary	117.8	
60	cage	269.5	
	aviary	275,3	
90	cage		
	aviary	385.5	
120	cage	397.5	
	aviary	522.5	
		aviary	534.5

In the first 30 days after the transfer of partridges to aviaries, the average daily gain of both cage and aviary partridges was almost the same. From day 31 to day 120, the gain in weight of the partridge mass kept in the vivarium in the cages was 5.8–12.0 g lower than in the aviaries.

All partridges from 7 to 31 days had almost the same weight gain rate of body weight, however, from 31 to 120 days, the gain in partridges in the vivarium increased compared to the weight gain in aviary. This phenomenon can be explained with low bird mobility in the vivarium and with optimal conditions in the cages in the vivarium.

Analysis of the data on the growth and development of stone partridge chicks (lat. *Alectoris chukar*) allows us to conclude that special attention should be paid to the organization of proper feeding in the first two weeks after the birth of the chicks, when their rapid growth and development is observed.

FINDINGS

1. The influence of negative living conditions on the development of young partridges of domestic fauna was revealed.

2. The life span of partridges of the first and second groups for the 13 and 25-day growing period reached 96% and 97%, respectively.

3 Preservation of partridges of the 3rd and 4th groups (where, along with heating, there was also irradiation of the room with ultraviolet and infrared radiation) for a 13-day growing period reached 100% of the value.

4 From day 31 to day 120, the gain in weight of the partridge mass contained in the vivarium in the cages was 5.8–12.0 g lower than in the aviaries.

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