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STUDY OF THE COMPARATIVE EFFECTS OF VETERINARY DRUGS ON OVARIAN ORGAN PATHOLOGIES IN QUAILS

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ИССЛЕДОВАНИЕ СРАВНИТЕЛЬНОГО ВОЗДЕЙСТВИЯ ВЕТЕРИНАРНЫХ ПРЕПАРАТОВ НА ПАТОЛОГИИ ЯИЧНИКОВ У ПЕРЕПЕЛОВ

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Abstract. This study investigated diseases affecting the reproductive organs of replacement quails during the period from their transfer to the parent flock up to 60 days of age. Additionally, the effectiveness of veterinary antibiotics applied for therapeutic and preventive purposes was evaluated. The findings demonstrated that improper selection of replacement birds prior to their introduction into the parent flock leads to a more pronounced manifestation of diseases after transfer. Quails carrying latent infections fail to produce eggs and are often culled within a short period, which negatively impacts the long-term productive utilization of the parent flock. Among the antibiotics used in the study, Ciplover and Avidox showed the highest efficacy in the treatment of oviduct-related diseases.

Аннотация. Изучались заболевания репродуктивных органов ремонтных перепелов в период с момента их перевода в родительское стадо до достижения 60-дневного возраста. Кроме того, была оценена эффективность ветеринарных антибиотиков, применяемых с лечебной и профилактической целью. Полученные результаты показали, что неправильный отбор ремонтного молодняка перед его переводом в родительское стадо приводит к более выраженному проявлению заболеваний после перевода. Перепела, являющиеся носителями латентных инфекций, не дают яйценоскости и в короткие сроки выбраковываются, что отрицательно сказывается на длительности продуктивного использования родительского стада.Среди применённых в исследовании антибиотиков наибольшую эффективность при лечении заболеваний яйцевода продемонстрировали препараты «Ципловер» и «Авидокс»

Keywords: quail, ovary, oviduct, disease, treatment, blood analysis, antibiotics

Ключевые слова: перепел, яичник, яйцевод, болезнь, лечение, анализ крови, антибиотики

The reproductive system constitutes a substantial proportion of the physiological structure of quails. Consequently, among non-infectious diseases affecting internal organs, disorders of the reproductive system in breeding (parent stock) quails are the most prevalent [5, 13, 17, 20-22].

Numerous researchers investigating poultry diseases have reported that reproductive organ disorders account for approximately 5.6–6.5% of all non-infectious diseases in birds [5, 15].

However, other studies indicate that in laying quails this proportion may reach as high as 22.5–30%, highlighting the increased susceptibility of this species [3, 14, 21].

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Studies aimed at identifying the etiological factors of reproductive system diseases in quails have demonstrated that such conditions are often associated with nutritional imbalances, including deficiencies of calcium and vitamins A, B2, B6, E, and D, as well as excess levels of phosphorus and protein in the blood and disruptions in amino acid ratios [11, 20].

According to several authors, inadequate housing conditions also play a critical role in disease development. Violations of zoohygienic standards — particularly improper microclimatic conditions, insufficient space allocation per bird in floor or cage systems, poor feeder and drinker accessibility, and faulty cage construction—significantly increase the risk of reproductive disorders in quails [10, 15, 17, 23].

Furthermore, suboptimal temperature levels and elevated relative humidity within poultry houses contribute to the occurrence of reproductive pathologies. High concentrations of harmful gases such as ammonia (NH_3) and hydrogen sulfide (H_2S), along with elevated coli-titer and coli-index values are also recognized as important contributing factors. Research findings further indicate that mechanical injuries play a significant role in the development of reproductive diseases. Improper cage design — such as large or damaged mesh openings, incorrect cage height for egg collection, and structural defects — can lead to trauma when birds fall or collide during movement, particularly from upper cage tiers. Such injuries significantly increase the incidence of reproductive organ disorders in breeding quails [2, 12, 14].

Violations of zoohygienic requirements often lead to pathological conditions of the ovary and oviduct, which may subsequently result in severe diseases such as salpingoperitonitis or yolk peritonitis. Even when affected birds are treated, their egg production is typically irreversibly impaired. Monitoring studies indicate that salpingitis and ovariosalpingitis are currently among the most frequently observed reproductive diseases in quails. Both contemporary data and historical reports confirm that these conditions have long been prevalent in poultry populations [2].

A notable challenge in poultry health management is that many diseases progress subclinically, becoming clinically evident only during peak egg production, when accurate diagnosis becomes possible. This is particularly characteristic of latent reproductive disorders in replacement quails. After being transferred to the parent flock, affected birds may either fail to lay eggs or produce eggs with significant abnormalities. To address these challenges, many researchers emphasize the importance of early diagnosis based on deviations in hematological and biochemical parameters from physiological norms. Such approaches are considered essential for the timely prevention and control of reproductive diseases [1, 8, 16, 24].

Studies also demonstrate that comprehensive diagnostic approaches — including bacteriological, serological, and biochemical methods—are necessary for the accurate detection of diseases such as salpingitis [5, 11, 16].

Investigations into pathological processes in quails have shown that systemic changes most frequently affect the liver and thyroid gland, particularly during periods of increased reproductive activity. These changes are often associated with trauma and are reflected in alterations in eggshell characteristics, including the appearance of abnormal coloration, especially green or greenish hues. The production of green eggs is considered a clinical indicator of reproductive system pathology in breeding quails [4, 21].

If preventive and therapeutic measures are not implemented in a timely manner, reproductive diseases may progress and become widespread within flocks during peak production periods. This is often associated with the dissemination of intestinal microflora to internal organs, leading to conditions such as salpingoperitonitis. In such cases, the meat of affected birds becomes unsuitable for consumption. Several authors suggest that pathogenic microorganisms ascend from the cloaca to the reproductive tract, particularly the oviduct, playing a key role in disease development [5, 25].

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In this regard, continuous monitoring of the structural and functional state of the oviduct is considered essential for disease prevention, especially in laying poultry [13].

Literature analysis and field monitoring conducted in quail farms in Azerbaijan indicate that reproductive disorders are frequently associated with nutritional deficiencies (particularly calcium and vitamins A, E, C, and D), excess protein and phosphorus, and mechanical injuries caused by falls or collisions in cage systems. Additionally, prolapse of the oviduct or frequent contact of the cloaca with contaminated litter can lead to infection and the rapid progression of reproductive diseases. In Azerbaijan, non-infectious diseases of the reproductive organs in quails account for approximately 10.5–27.6% of all non-infectious conditions observed in poultry farms. Considering the above, it is essential to ensure the timely prevention of reproductive diseases and to evaluate the effectiveness of veterinary pharmaceuticals used for both therapeutic and prophylactic purposes.

Materials and Methods

The study was conducted at the Vivarium of the Azerbaijan State Agrarian University and at a training and experimental quail farm with an annual capacity of 109,000 birds. Experimental trials were performed on 35–60-day-old White English replacement quails and parent stock, following a structured experimental design.

Table 1

RESEARCH SCHEME

Groups	*Medicines used in veterinary medicine*
Control	1 gram of tromexin is dissolved in 1 liter of water and applied for 5 days
Experiment I	Colifox is dissolved in 0.5 ml-1 liter of water and applied for 5 days
Experiment II	Chiprovet is added to 1 gram of mixed fodder and applied for 5 days
Experiment II	Avidox 0.1 mg is added to 1 kg of mixed fodder and applied for 5 days

In the control group, the treatment protocol routinely applied in the farm was implemented. In the experimental groups, however, veterinary antibiotics were administered. Each group consisted of 50 birds, and treatment was carried out by incorporating the antibiotics into both drinking water and compound feed. During the treatment period, in addition to antibiotic therapy, all groups — including both control and experimental groups—received dietary supplementation. The basal diet was enriched with 3% Aydag zeolite, 30% germinated wheat exposed to ultraviolet irradiation, and 3 grams of minced fish meal prepared from the head portion of sprat. At the beginning and at the end of the experiment, the clinical and physiological parameters of the quails were assessed using standard, widely accepted methodologies. Throughout the experimental period, egg production from the first day after the transfer of replacement birds into the parent flock was recorded, and egg quality parameters were evaluated. Furthermore, the reasons for culling parent quails during the experiment were identified, and abnormalities observed on the eggshell surface were documented. The ratio of egg albumen to yolk, as an important quality indicator, was also determined.

Results of the Study

During the study, clinical parameters of replacement quails of the White English breed, transferred to the parent flock and suspected of disease, were evaluated 15 days after antibiotic administration. The results obtained from these examinations are presented in Table 2.

As shown in Table 2, measurement of body temperature revealed that in the control group the internal temperature of parent quails was 41.8 ± 0.79°C, whereas in the second experimental group,

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which received treatment, it was 41.1°C. In the other experimental groups, similar to the control group, body temperature values were found to be at the upper limit of the physiological norm.

Table 2

CLINICAL INDICATORS OF MOTHER QUAILS AT 60 DAYS

Groups	*Internal body Temperature, °C*	*Heart rate, beats/min*	*Respiratory rate, breaths/min*
Control	41.8 ± 0.79	284.6 ± 2.33	28.1 ± 0.39
Experimental Group I	41.87 ± 1.04	297.6 ± 2.19	29.8 ± 1.03
Experimental Group II	41.1 ± 0.77	262.6 ± 1.84	22.14 ± 0.32
Experimental Group III	41.59 ± 1.14	276.7 ± 2.06	27.7 ± 0.54

The analysis of physiological parameters demonstrated that heart rate and respiratory activity remained comparatively elevated in the control group as well as in Experimental Groups I and III. In the control group, the average heart rate was recorded at 284.6 beats per minute, while the respiratory rate reached 28.1 breaths per minute. In contrast, parent quails treated with the Chiprovet preparation in Experimental Group II exhibited lower values for these parameters, amounting to 262.6 beats/min and 22.14 breaths/min, respectively. Furthermore, birds in Experimental Group I also showed increased physiological activity, with heart and respiratory rates reaching 297.6 beats/min and 29.8 breaths/min, respectively.

The obtained findings indicate that, among all antibacterial agents administered during the 5-day treatment period, Chiprovet demonstrated the highest therapeutic efficacy in the management of reproductive organ disorders. The clinical manifestations observed in treated parent quails varied depending on the effectiveness of the therapeutic intervention. In the control group, five birds presented with general weakness, cyanosis of featherless skin areas, and contamination of feathers surrounding the cloaca with foul-smelling exudate.

Comparable pathological signs were identified in four birds from Experimental Group I, one bird from Experimental Group II, and three birds from Experimental Group III.

Simultaneous hematological and biochemical evaluation of blood parameters (Table 3) revealed that, at 60 days of age, erythrocyte levels in the control, Experimental Group I, and Experimental Group III were lower by 0.38, 0.39, and 0.51 × 10^9/L, respectively, compared with those observed in Experimental Group II. Conversely, leukocyte counts were elevated in all examined groups; however, the lowest leukocyte concentration was still detected in Experimental Group II (16.22 × 10^9/L), which was 4.6 × 10^9/L lower than the highest value recorded in Experimental Group III (20.82 × 10^9/L).

Assessment of hemoglobin concentration demonstrated that hemoglobin levels in the control, Experimental Group I, and Experimental Group III were 94.4 g/L, 94.2 g/L, and 95.8 g/L, respectively. In comparison, quails treated in Experimental Group II exhibited markedly higher hemoglobin concentrations, exceeding the corresponding values of the other groups by 14.4, 14.2, and 12.2 g/L, respectively.

Alterations in hemoglobin levels were found to correspond closely with the changes observed in erythrocyte counts. The results indicated that a decrease in erythrocytes and hemoglobin, accompanied by an increase in leukocytes, reflects the presence of pre-existing anemia and inflammatory processes in replacement quails prior to their transfer into the parent flock. During the study, the erythrocyte sedimentation rate (ESR) was measured at 15 minutes, 30 minutes, and 1 hour across all groups. It was established that ESR values at 1 hour reached the upper limit of physiological norms in all groups. This finding, when considered alongside clinical indicators, suggests incomplete recovery of the reproductive organs in parent quails.

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Table 3

MORPHOLOGICAL AND BIOCHEMICAL BLOOD PARAMETERS OF PARENT QUAILS AT 60 DAYS OF AGE

Groups	*Erythrocytes, 10^{12}/L*	*Leukocytes, 10^{9}/L*	*Hemoglobin, g/L*	*ESR, mm/min, 60 min*	*H*	*Calcium, mmol/L*	*Phosphorus, mmol/L*
Control	2.91±0.04	19.78±0.22	94.4±2.06	3.54	7.48	3.08±0.01	1.97±0.01
Experimental Group I	2.90±0.02	19.81±0.13	94.2±3.01	3.58	7.88	3.09±0.01	1.86±0.02
Experimental Group II	3.29±0.02	16.22±0.19	108.8±2.29	3.29	7.24	3.09±0.01	1.47±0.02
Experimental Group III	2.78±0.02	20.8±1.04	95.6±2.27	3.48	7.55	3.06±0.01	1.89±0.02

Assessment of blood pH revealed that, even in quails selected as disease-suspected and treated up to day 60, this parameter remained at the higher end of the physiological range. The highest pH values were recorded in the control group and in experimental groups I and III, whereas in experimental group II, pH values were at the lower limit of the physiological norm.

At the conclusion of antibiotic treatment, the concentrations of calcium and phosphorus, as well as their ratio, were determined. The results showed that the calcium-to-phosphorus ratio in the control, experimental group I, and experimental group III was 1.56:1, 1.69:1, and 1.61:1, respectively. These values indicate a relative excess of phosphorus in the organism, which serves as an important differential diagnostic indicator for diseases of the reproductive organs.By day 60 of the study, culling rates were recorded as follows: 8 birds in the control group, 4 birds in experimental group I, 2 birds in experimental group II, and 4 birds in experimental group III.

Table 4

EGG PRODUCTION AND EGG ABNORMALITIES IN DISEASE-SUSPECTED REPLACEMENT QUAILS FROM THE DAY OF THEIR TRANSFER TO THE PARENT FLOCK UP TO 60 DAYS

Parameters	*Groups*			
	Control Group	*Experimental Group I*		
Number of eggs produced (units)	139	167	229	207
Egg weight (g)	10,49±0,36	10,38±0,27	10,86±0,43	10,61±0,56
Eggshell weight (g)	1,41±0,04	1,40±0,04	1,45±0,02	1,43±0,03
Egg white (albumen) weight (g)	4,61±0,36	4,58±0,14	4,73±0,21	4,69±0,11
Egg yolk weight (g)	4,47±0,59	4,40±0,22	4,68±0,37	4,49±0,20
Eggshell Abnormalities	12	14	2	6
Type of abnormality				
Completely green eggshell (units)				
Marbled coloration (units)	4	2	0	1
Striped pattern (units)	2	-	-	-
Plaque-like protrusions (units)	2	1	1	1
First-grade eggs (%)	72	82	94	85
Second-grade eggs (%)	28	18	6	15
Non-marketable eggs (units)	20	17	3	8

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In the control group, culling was attributed to digestive system disorders in 2 birds, mechanical injury in 1 bird, and reproductive organ diseases in 5 birds. In experimental group I, culling resulted from digestive disease (1 bird), ovarian regression (1 bird), cloacitis (1 bird), and inflammatory processes affecting the ovary and oviduct (1 bird). In experimental group II, one bird was culled due to limb fatigue and another due to egg retention (failure of egg passage through the oviduct). In experimental group III, 2 birds were culled due to ovarian disorders and 2 due to oviduct diseases.

The effect of antibiotic treatment on egg production in replacement quails after their transfer to the parent flock was also evaluated. The obtained results are presented in Table 4. The conducted research further confirms that the effectiveness of antibiotics used for therapeutic and preventive purposes varies in relation to diseases of the reproductive organs.

Replacement quails newly introduced into the parent flock initially failed to produce eggs, and various reproductive disorders were observed among them. Examination of 200 selected birds revealed that, despite their recent transfer to the parent flock, egg production remained low, particularly in the control group, where only 139 eggs were obtained. Of these, 20 eggs were deemed unsuitable for sale, and 21% were classified as second-grade eggs (it should be noted that in many countries eggs are not categorized into first and second grades).

In experimental group I, a total of 167 eggs were produced, of which 17 were completely unfit for use, while approximately 20% were classified as second-grade eggs. In contrast, in experimental group II, of the 229 eggs produced, only 3 were unsuitable for sale; 6% were classified as second-grade, whereas 94% met the criteria for first-grade eggs.

Conclusion

Replacement quails selected for transfer to the parent flock must undergo careful selection procedures, including prior clinical screening. Birds suspected of disease should be excluded from the flock. If, during the initial period of egg production, reproductive organ disorders are suspected or diagnostically confirmed, appropriate therapeutic or preventive measures should be implemented. In such cases, it is recommended to administer 1 g of Chiplovet per 1 kg of compound feed for a duration of 5 days.

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