

SANITARY AND HYGIENIC ASSESSMENT OF PRODUCTS OBTAINED FROM SLAUGHTERING LAYING QUAILS WITH DISEASES OF THE EGG-FORMING ORGANS

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Abstract. Quail farming is one of the fastest-growing and most economically profitable sectors of poultry production in Azerbaijan. However, non-contagious reproductive organ diseases significantly reduce the productivity and sanitary quality of slaughter products obtained from laying quails. The objective of this study was to conduct a veterinary-sanitary assessment of the meat and by products of quail affected by ovarian and oviduct pathologies, including peritonitis, salpingitis, oviduct rupture and tumors. The research was conducted on White English and Manchurian Golden quails at the educational farm of the Azerbaijan State Agrarian University and on farms throughout the Ganja-Gazakh region. Clinical, hematological and pathoanatomical examinations revealed severe inflammation, elevated leukocyte counts, reduced hemoglobin levels and notable deviations in homeostasis. Productivity indicators were sharply reduced and the live weight, slaughter yield and meat commodity category did not meet regulatory standards. Pathological changes, such as the accumulation of serous-fibrinous exudate, concretions and tumor-like formations, were detected in 70% of the diseased birds. The meat of affected quails displayed altered organoleptic and chemical properties, including increased moisture content and decreased protein, fat and ash content. The study concludes that products from quails with reproductive organ diseases can only be used after undergoing mandatory high-pressure heat treatment. Carcasses showing advanced purulent-necrotic or tumor processes must be completely excluded from the food chain. These results underscore the importance of veterinary-sanitary assessments in ensuring food safety and preventing disease risks to consumers.

Keywords: Quail, peritonitis, salpingitis, ovarian tumors, slaughter products, eggshell, oviduct.

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1. Introduction

For Azerbaijan's population, poultry farming is the most accessible and profitable industry. In recent years, quail farming has intensely developed in the republic, as quail are the smallest of the farm bird species. Starting at seven weeks of age, quails can produce 160-380 grams of meat containing 23-25% protein and 4% fat.

The author (Kharchuk, 2012) argues that quail breeding is currently more profitable than breeding other birds. They rank first in terms of profitability in poultry farming and female quails can mate at any time of the year. Commercial egg production can be carried out without males (Tagiyev & Huseynova, 2017). Non-contagious diseases, including those of the reproductive organs, hinder the improvement of meat and egg quality. Currently, diseases of the reproductive organs are widespread among laying quails on quail farms in the natural and climatic zones of Azerbaijan (there are 11 such zones in the world and nine of them are located in the republic) (Tagiyev & Huseynova, 2017).

Research studies (Bessarabov & Vasilevich, 2007) show that reproductive organ diseases are recorded in adult laying hens, accompanied by inflammation of the serous membranes, peritoneum and intestines after yolk masses enter the abdominal cavity, often occurring in laying hens simultaneously with diseases of the oviduct and ovary.

In hot climates, mainly in the summer, inflammation of the serous membranes of the peritoneum is recorded among laying quails on farms and the oviduct increases in volume. The esophagus contains inflammatory products displaced with protein and yolk. Peritonitis leads to death due to prolonged egg retention (Krotova *et al.*, 2010; Seregin *et al.*, 2014). Homeostasis does not correspond to physiological norms. In recent years, on farms, laying quails have been affected by 30-40% with yolk peritonitis, 25-30% with salpingitis, 20-25% with difficult egg laying, 10-15% with oviduct rupture and 10% with various diseases, including ovarian and oviduct tumors (Moisenko, 2016; Tagiev & Guseynova, 2016).

The treatment of quails with reproductive organ diseases is ineffective, so farmers cull them and send them to slaughter.

However, regulatory and legislative veterinary documents in Azerbaijan still do not include recommendations for the safe and rational use of carcasses and byproducts from laying quail with reproductive organ diseases.

The purpose of this study is to: To provide an objective sanitary and hygienic assessment of quail slaughter products with reproductive organ diseases.

2. Materials and methods

The study was conducted at the educational and experimental farm of the Azerbaijan State Agrarian University, where 109,000 quails are raised per year. Monitoring was also carried out in the Ganja-Gazakh region of Azerbaijan. The quails were primarily White English and Manchurian Golden breeds.

The meat and internal organs of laying quails that were culled due to inflammation of the ovary or oviduct, rupture of the oviduct or tumors of the ovary or oviduct at various stages of disease of the egg-forming organs were examined.

A diagnosis was made based on the clinical, physiological and internal indicators of the laying quails. When studying the pathoanatomical changes, special attention was given to the condition of the ovarian wall and the oviduct in order to detect lipomas, fibromas and hemoblastomas.

3. Research results

The disease was recorded in adult laying quails. During autopsy, inflammation of the serous membranes and oviduct was observed and the oviduct was found to be enlarged. Protein masses with exudate were found in the cranial part of the oviduct. Concretions were sometimes found in the oviduct. Ovarian and oviduct infantilism were often observed during autopsy. Among laying quails, 25-30% of pathological examinations revealed oviduct rupture. Parasites appeared after the lumen of the oviduct was blocked by eggs, fibrinous masses and products of the inflammatory process. Table 1 presents the study of the clinical and physiological indicators of sick and healthy laying quails.

Sick laying quails had an elevated body temperature of 41.92°C, a pulse of 189.3 and a respiratory rate of 38.9 per minute.

Table 1. Clinical and hematological indicators of laying quails with diseases of the egg-producing organs

Indicators	Patients	Healthy	Difference
Temperature body, °C	41,92±0,34	41,02	0,9
Pulse rate, per minute	189,3±1,48	162,0±1,21	27,3
Respiratory rate, per minute	38,9±0,76	34,1±1,04	4,8
Erythrocytes 10 ¹² /L	2,61±0,26	3,08±0,12	0,47
Leukocytes 10 ⁹ /L	38,94±0,15	29,4±0,31	9,5
Hemoglobin, g/L according to Salli	82,4±2,14	104,4±2,41	22
ESR, mm	3,19±0,1	2,39±0,2	0,8
blood pH	6,04±0,32	7,82±0,51	0,78

The table shows that the number of red blood cells in the blood of sick laying quails decreased by $0.9 \times 10^{12}/L$ compared to healthy quails and amounted to $2.61 \pm 0.26 \times 10^{12}/L$, while hemoglobin decreased to 82.4 g/L. The data show that in cases of disease of the egg-producing organs, the number of leukocytes increased by 38.94 and the ESR increased to 3.19 mm/hour.

When assessing the weight of laying quail, we also studied the physical and chemical indicators of the meat, determining the pH level, the reaction to hydrogen sulfide and ammonia and the presence of fatty acids. It was also established that these indicators do not fully comply with regulatory documents regarding food suitability. To evaluate the productivity of the sick quail, their live weight, fat category and slaughter yield were determined. The data obtained for these indicators are shown in Table 2.

Table 2. Productivity indicators for laying quails (M±m)

Indicators	Sick laying quails	Healthy laying quails
Live weight, g	125,6±1,79	295,9±2,06
Slaughter yield, %	42,6±0,94	64,2±0,76
Fattening categories, %:		
Category I	8	81
Category II	42	19
Non-standard, %	50	---

As shown in Table 2, the commodity indicators of sick laying quails do not meet the accepted standards.

During the study, we also compared the morphometric indicators of the oviducts of sick and healthy laying quails (Table 3).

Table 3. Ovary and oviduct weight of sick and healthy laying quails

Indicators	Sick laying quails	Healthy laying quails
Ovarian weight, g	6,2±0,2	4,3±0,2
Oviduct weight, g	26,9±1,33	22,6±1,09

Analysis of the data in Table 3 shows that quails with reproductive organ diseases have lower ovarian and oviduct masses than healthy laying quails. This is due to concretions forming in the ovaries and oviducts of sick quails from hardened oviduct secretions. Additionally, tumors in the form of fluid-filled bubbles were found in the oviducts of the diseased quails, which also contributed to an increase in reproductive organ mass.

Pathological autopsies revealed that the ovaries and fallopian tubes had increased in mass by 1-1.2 times and the serous membrane was covered with serous and fibrinous exudate in both the ovary and the fallopian tube. In most cases, a hardened yellow mass measuring 3-4 cm was observed in the right and left parts of the ovary. A whitish-yellowish exudate was observed inside the fallopian tube. The above changes were observed in 70% of the 50 sick birds slaughtered during the experiment. In addition, an unpleasant odor was detected during the autopsy of the abdominal cavity. The muscle changed color and became yellowish-blue. The examination of the meat revealed an increase in water content by 3.4-4.0%, a decrease in protein by 1.8-2.1% and a decrease in fat by 3.1-3.3%. When the meat was roasted in a muffle furnace, a decrease in ash content of 0.9% was observed. The broth from the cooked meat had an odor that did not correspond to the smell of quail meat.

4. Conclusion

When forced slaughter of laying quails suffering from diseases of the egg-producing organs is necessary, a thorough veterinary and sanitary examination must be carried out in order to make an accurate diagnosis and assess the extent of pathological changes. Products from the slaughter of such birds are permitted for limited use only after mandatory heat treatment - cooking under high pressure in a steamer, which ensures the destruction of possible pathogenic microflora and minimizes risks to consumer health. However, if advanced or severe forms of the disease are detected, accompanied by pronounced purulent-necrotic changes, the presence of metastatic tumors or signs of general intoxication of the body, the meat must be completely removed from the food chain. In such cases, strict restrictions on its use must be imposed, including the disposal of products in accordance with sanitary standards. Thus, the sanitary and hygienic assessment of slaughter products plays an important role in ensuring consumer safety and preventing the spread of diseases among livestock and humans.

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