

LIAKHOVICH L. M. 

State Biotechnology University,
Ukraine, 61002, Kharkiv, Alchevskikh str., 44, liubov.vet@ukr.net

MONITORING THE PREVALENCE OF REPRODUCTIVE ORGAN TUMORS IN DEAD CHICKENS OF HIGH-PRODUCTIVE EGG-LAYING CROSS

Aim. Monitoring the spread of reproductive organ tumors in deceased chickens of the high-yielding egg cross Loman Brown. **Methods.** Clinical observation; autopsy, registration and analysis of its results; anatomical dissection. **Results.** According to the results of autopsies, 100% of the examined deceased adult female domestic chickens of the Loman Brown cross were found to have neoplasias localized in the reproductive organs (in the ovary, the wall of the oviduct and its mesentery). The peak mortality of chickens was observed in the age range of 720–780 days. All studied chickens were representatives of the same breeding line and, during their lives, were kept in the same conditions. **Conclusions.** All the examined dead chickens of the Loman Brown breed aged 720–780 days had tumor lesions of the reproductive organs, which indicates their high susceptibility to neoplasia. Accounting for cases of oncological lesions of the reproductive organs in domestic chickens, detected during postmortem examinations, contributes to reliable statistics on the spread of this pathology. It is advisable to create a single information database indicating all cases and variants of oncological lesions detected in poultry of a specific species, breed, breeding line, and age group.

Keywords: autopsy, chickens, Loman Brown, neoplasia.

The purpose of breeding individual crosses of modern chickens was, in particular, a high egg-laying index. The leaders in this indicator are, first of all, the Loman Brown cross hens (Bazyvoliak et al., 2022, Gacovski et al., 2019). Chickens of other crosses (Dominant Blue, Dominant Black, Leghorn, etc.) are also highly productive layers (Liakhovich et al., 2025, Preisinger, 2018). High-yielding hens ovulate at intervals of about 24 hours and, under

optimal feeding and housing conditions (lighting parameters, the required level of nutritional substrates, primarily protein, as well as vitamins, calcium, other minerals and feed components), lay a full-fledged egg almost every day (Usenko et al., 2022).

It is known that the Loman Brown crossbred hens, like other high-yielding egg crosses, have a very weak maternal instinct. They have virtually no ability to hatch eggs. At the same time, scientists point to an obvious high correlation between the frequency of ovulation (and its consequences) and the spread of ovarian cancer (Pal et al., 2021).

In experimental oncology, the laying hen is used as the only animal model of human ovarian adenocarcinoma (Niebora et al., 2024). After all, at the macroscopic, histological, and genetic levels, this tumor pathology is similar in humans and chickens (Johnson and Giles, 2013). Chickens of certain modern breeding lines have a high tendency to develop this pathology.

Scientists indicate that ovarian tumors, which are often registered in laying hens of some high-yielding crosses, arise as a result of the influence of a combination of factors. The main ones are : continuous ovulation, which causes repeated damage/repair of the ovarian surface epithelium, genetic predisposition, and hormonal influence (in particular, due to high estrogen levels).

The risk of developing such lesions increases with violations of chicken welfare parameters and the use of various, in particular, prohibited egg production stimulation programs (when using feed, so-called, pure hormonal preparations).

Neglecting the above leads to serious consequences with the spread of oncological lesions in chickens and the loss of their livestock. Information that highlights data on the spread of tumor lesions of the reproductive organs in



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domestic chickens is valuable both in a scientific and practical sense.

Materials and methods

The aim of the study was to determine the prevalence of reproductive organ tumors in deceased domestic chickens of high-yielding crossbreeds in the conditions of a specific poultry farm. The research was staged: stage 1 – collection of anamnestic information; clinical examination of chickens; stage 2 – conducting a pathological autopsy of dead chickens, recording the detected changes, their identification, classification, formulation of a pathological diagnosis; stage 3 – anatomical dissection of the changed organs.

The material for the study was dead domestic laying hens ($n = 32$) of the high-yielding egg cross Loman Brown and their organs. All hens were representatives of the same breeding line and at the time of the study were kept on a private poultry farm ($n = 47$) in a poultry house with a walking area. The conditions of keeping and feeding chickens in the mini-farm met the regulatory requirements. Clinical examination of chickens was carried out on the mini-farm. During the monitoring, which lasted from the beginning of the second phase of laying until the death of chickens (age range – 43–130 weeks), 68.1% of individuals died. The peak of mortality was observed in chickens at the age of 720–780 days.

Pathological examination of dead chickens was carried out according to general rules (Kotsiumbas et al., 2015, Zakhariyev et al., 2025) in an accredited veterinary medicine laboratory. During the pathological examination of dead chickens, macroscopic parameters of organs and tissues were assessed using a set of optical lenses for optimal visualization of structural changes; a protocol was drawn up describing the main characteristics of organs and tissues *in situ*; evisceration of organ complexes and anatomical dissection of individual organs were performed, as well as identification and classification of detected pathologies.

When examining the ovary in dead chickens, the state of the hierarchical gradation of follicles was determined. When examining the oviduct, the integrity and thickness of its wall were determined; the state of the serous and mucous membranes (color, relief, degree of blood filling). The diameter of the lumen of the oviduct and its patency were also examined (if there was content, its quantity, consistency, color, odor, and composition were determined).

Results and discussion

Anamnestic information. From the anamnestic data it became known that at the time of the start of laying all the studied hens were kept in battery cages in the conditions of a large commercial poultry farm. Then, as part of a humane animal protection program, these chickens were placed on a private free-range mini-farm with optimal welfare parameters. At the same time, a significant criterion for suspicion of possible damage to the reproductive organs of the studied chickens was a decrease in egg production and a significant proportion of defective eggs (with shell destruction defects).

The sign of softening of the shell is considered a significant diagnostic criterion, in particular, adenovirus infection, infectious bronchitis of chickens, calcium deficiency (Liakhovich et al., 2023, Pereira et al., 2019). These pathologies were excluded during differential diagnosis.

Clinical examination of chickens. During all periodic clinical examinations of chickens, it was found that some of the flock had a violation of the rhythm of laying and signs of discomfort and pain during it. Such hens, as a rule, laid eggs not only with defects in the shell texture, but also with a violation of the composition of the internal components (protein and yolk).

Other hens did not lay eggs for a long time and for this reason they were culled (they were usually diagnosed with signs of ascites, anemia, and exhaustion).

Pathological examination of dead chickens. All dead chickens of the studied poultry farm were subjected to a complete pathological autopsy. In this case, macroscopic changes in the ovary were diagnosed in most chickens. In the most severe cases, the ovary had the appearance of a conglomerate, which outwardly resembled a head of cauliflower. It contained single or multiple dense nodules of whitish color, as well as individual cysts filled with a dull oily mass of brown shade. In other hens, numerous yolk follicles with signs of deformation were found in the ovary. Their contents were liquid, greenish-gray in color. Some follicles had a destroyed membrane, in which signs of hemorrhages were found. As is known, under normal conditions, a clear hierarchy of preovulatory follicles is detected in the functional ovary of a laying hen. In hens with cessation of egg laying, the ovary regresses and there are no preovulatory follicles in it (Fig. 1).

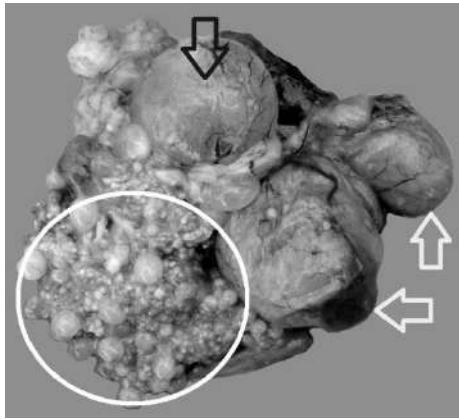


Fig. 1. Cancerous ovary of a Lohman Brown hen (age 2 years 1 month): numerous white and cream tumor nodules (oval); cystic formation (black arrow); atresed follicles (white arrows) (own source).

But in such cases, there are no structural changes in the ovary. In some dead chickens, in addition to individual altered follicles, intact follicles were also found in the ovary, which indicated the preservation of ovulation.

One deceased hen was diagnosed with disseminated oncological lesions of the reproductive and visceral organs. A giant tumor with multiple cyst-like formations was found in her (Fig. 2). It was classified as “paraovarian” by localization.



Fig. 2. Paraovarian cyst-like tumor removed from the coelomic cavity of a deceased domestic chicken (Loman Brown cross) (own source).

At the same time, obstruction of the lumen by masses of unformed and coagulated egg parts, which had the appearance of rubber-like ovoid-spherical formations of beige color, was observed in the oviduct of such chickens. Similar changes

with obstruction of the lumen of the oviduct were found in Loman Brown cross chickens with trichomoniasis (Liakhovich et al., 2024).

Less frequently, in the studied hens, the oviduct had a free lumen, but upon detailed examination of its walls and mesentery, tumor nodules of whitish-beige color were revealed, which were located both singly and in the form of clusters. In three hens, the oviduct was reduced, which correlated with critical damage to the ovary. In 12 hens, severe deformation of the oviduct wall was observed, combined with complete or partial obturation of its lumen. This indicates a chronic course of such lesions. However, due to the lack of specific clinical symptoms, they are usually diagnosed postmortem.

Based on the results of the pathological examination, it was established that in all dead chickens, tumor lesions were localized in the reproductive organs (in the wall of the oviduct and its mesentery, in the ovary, or with a simultaneous combination of their lesions).

In some of the dead chickens, metastases of the primary tumors to other parts of the body (into the intestinal mesentery, pancreas, glandular stomach) were also found.

According to the results of the study, ovarian and oviduct cancer was diagnosed in hens aged 720–780 days. This is due to the large number of ovulations that occurred and the frequent damage to the ovarian epithelium that occurs with it, as well as age-related changes in the hormonal profile.

Taking into account the results obtained during pathological examinations of dead chickens, a differential diagnosis was carried out of the detected changes in the reproductive and other organs with similar signs, which could probably be caused by other diseases. First of all, Marek's disease, the visceral form of which is characterized by tumor-like lesions localized in various organs and tissues, was excluded. The detected changes were also differentiated from lymphoid growths that occur in avian leukemia.

The reproductive ability of female domestic chickens is a significant marker for determining the efficiency of the poultry industry and a criterion for bird welfare. The study of pathomorphological changes in the reproductive organs of dead chickens contributes to the reliable determination of the pathogenetic links of diseases, their diagnosis, and the effectiveness of appropriate preventive measures. Information obtained during autopsies of dead hens with cessation of egg production

significantly complements the theoretical and applied resource regarding the etiology of relevant pathologies and their prevention (Liulin et al., 2023, Srinivasan et al., 2014).

Conclusions

All of the examined dead Loman Brown crossbred chickens aged 720–780 days had tumor lesions of the reproductive tract, which indicates their high susceptibility to neoplasia in the indicated age range. Accounting for cases of oncological lesions in domestic chickens, detected

during postmortem examinations, contributes to reliable statistics on the spread of this pathology. It is advisable to create a single information database indicating all cases and variants of oncological lesions detected in poultry of a specific species, breed, breeding line, and age group.

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ЛЯХОВИЧ Л. М.

*Державний біотехнологічний університет,
Україна, 61002, м. Харків, вул. Алчевських, 44*

МОНІТОРИНГ ПОШИРЕННЯ ПУХЛИН РЕПРОДУКТИВНИХ ОРГАНІВ У ЗАГИБЛИХ КУРЕЙ ВИСОКОПРОДУКТИВНОГО ЯЄЧНОГО КРОСУ

Мета. Моніторинг поширення пухлин репродуктивних органів у загиблих курей високопродуктивного яєчного кросу Ломан Браун. **Методи.** Використано методи клінічного спостереження; автопсії, протоколювання та аналізу її результатів; анатомічного препарування. **Результати.** За результатами автопсій, у всіх обстежених загиблих дорослих самиць свійських курей кросу Ломан Браун виявлено неоплазії, локалізовані в репродуктивних органах (у яєчнику, стінці яйцепроводу та його брижі). Пікова смертність курей спостерігалася у віковому діапазоні 720–780 днів. Усі досліджувані кури були представницями однієї селекційної лінії та протягом життя утримувалися в однакових умовах. **Висновки.** У всіх досліджених загиблих курей породи Ломан Браун віком 720–780 днів були виявлені пухлинні ураження репродуктивних органів, що свідчить про їх високу схильність до неоплазії. Облік випадків онкологічних уражень репродуктивних органів у свійських курей, виявлених під час патологоанатомічних досліджень, сприяє достовірній статистиці поширення цієї патології. Доцільно створити єдину інформаційну базу із зазначенням всіх випадків та варіантів онкологічних уражень, виявлених у свійської птиці конкретного виду, породи, селекційної лінії та вікової групи.

Ключові слова: автопсія, кури, Ломан Браун, неоплазія.

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