Scientific Works. Series C. Veterinary Medicine. Vol. LXVIII (1), 2022
ISSN 2065-1295; ISSN 2343-9394 (CD-ROM); ISSN 2067-3663 (Online); ISSN-L 2065-1295

AGGRESSION OF BROILER BREEDER MALES AGAINST FEMALES IN A POULTRY REPRODUCTION FARM: INJURIES AND POSSIBLE CONTRIBUTING FACTORS

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Abstract

The present paper aims to present the aggressive behavior of broiler breeder males against females and its consequences. The research took place in a breeding poultry farm and the objectives were: to identify and describe the specific lesions found in females and to observe the behavior of the roosters in relation to the females in order to identify behavioral patterns. In the study, 15 corpses were examined and the specific lesions of aggression were described, analyzing the location, extent and acute or chronic nature of the wounds. Thus, it was found that the main areas where the lesions were found, are the head and torso and from the point of view of depth, superficial and deep lesions were identified. Another aspect observed was the clear differentiation of lesions caused by aggression from those caused by cannibalism. Following the behavior observation sessions, it was found that the courtship behaviour of the roosters was poor expressed or even missing, which led in forced mating, and resulted in the described lesions.

Key words*: the aggressiveness of roosters, broiler breeders, animal aggressiveness, poultry behavior.*

INTRODUCTION

Poultry farming, since the domestication of the first wild hens in the Asian jungle to the current level of intensive breeding, has been an important zootechnical branch throughout the contribution of very good quality animal products.

The aggressiveness of roosters towards chickens, in the populations of birds used for breeding, is a phenomenon encountered in poultry units with an intensive breeding system and has been described in the literature. This has been described in the case of roosters belonging to parental broiler lines (Millman et al., 2000).

The aim of the present study was to describe from an anatomopathological point of view the lesions found in the corpses of females, those lesions being produced by the aggressive behavior of roosters. In addition to the necropsy examination of the carcasses, the behavior of the roosters in the bird population was monitored and some observations were made in this matter.

The present study helps identify the aggressive phenomenon in bird populations and to also differentiate it from the cannibalism.

Another importance of the study is its interdisciplinary nature, as it includes both information appropriate to the pathology and observations on the aberrant behavior of roosters, related to etopathology.

MATERIALS AND METHODS

The present study was conducted on a breeding poultry farm for a period of 37 weeks. The studied population of birds is from the category of "slow-growing colored broilers". The breeding hall has a total area of 980 m². The entire hall was populated with 5.440 one-day-old females and 536 roosters of the same age.

At the age of 8 weeks, after some restructuring of the herd, 5.000 females and 450 males remained in the breeding hall.

The females and the males have been raised together since the age of one day old.

In the previous breeding cycle, a high rate of aggression of roosters towards females was observed, a phenomenon resulting in severe injuries, some of which lead to the death of many birds.

Based on these observations, the entire batch was monitored anatomopathologically, from the hall's population until week 37. The aim

was to identify, analyze and describe the lesions caused by the aggressive phenomenon and to identify possible causes of its onset. 15 corpses with visible signs of aggression were examined. During the examination, the location, depth, and age (acute / chronic) of the lesions were monitored.

The used necropsy technique was the classical one, comprising in general the external examination, the plucking, skinning and the internal examination of the corpses (Militaru et al., 2007; Ciobotaru, 2013).

The behavior was observed in 20-30 minute per session, after the birds got used to the presence of the observer. The aim was to identify the different behavioral patterns of males in relation to the females.

RESULTS AND DISCUSSIONS

Overview of lesions

There are two main locations of the lesions: on the head (Figures 1-4) and on the trunk (Figures 3 and 5). The lesions present on the trunk can be found either on the dorsal region of the trunk or on one or both lateral faces of the thighs. The distribution of lesions in the case of the 15 corpses examined in the study can be observed in Table 1.

Table 1. Number of cases depending on the location of the lesion

Location of lesions	Number of cases
Cranial / cervical	7 cases
Dorsal region of the trunk + side faces thighs	5 cases
Dorsal region of the trunk + lateral faces thighs + cranial / cervical	3 cases

Figure 1. 23-week-old hen with acute lesion in cranio-cervical region

Figure 2. 23-week-old hen with acute lesion in craniocervical region

Figure 3. 29-week-old hen with an acute lesion in the lateral region of the thigh

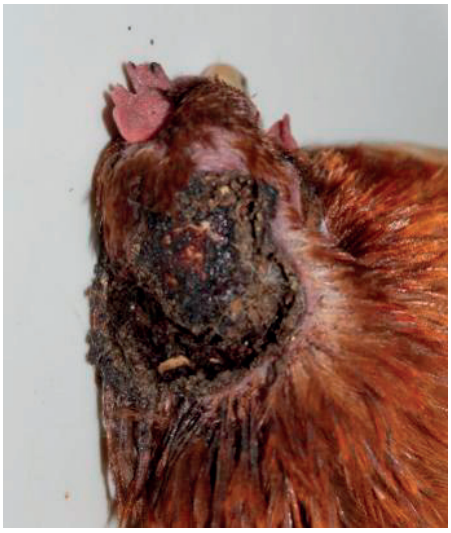

Figure 4. 27-week-old hen with subacute lesion in cranio-cervical region

Figure 5. 35-week-old hen with an acute lesion in the lateral region of the thigh

Figure 6. 37-week-old hen with acute lesion in the cranial region

The extent of the lesion and the depth of the traumatic agent's action

Looking from a depth perspective of the traumatic agent's action, the lesions include the skin, the subcutaneous connective tissue and the muscular surface.

The skin in the dorsal region of the trunk is torn apart by the claws of the roosters during the mounting process.

Once the skin is torn apart, during the attempts to perform the mount, the males tear apart the exposed muscles. Because of this fact, it is explained the presence of scratches of different degrees of depth, found on the surface of the corpse muscles (Figures 7-9).

Figure 7. 29-week-old hen with a wound on the side of her thigh. Perilesional fibrin deposition is observed

Figure 8. 30-week-old hen with deep tears in her thigh muscles

Figure 9. 36-week-old hen with superficial scratches on the muscles of the thigh

After the skin is torn apart, its edges retract. This process represents a vital local reaction due to the presence of muscle fibers in the skin architecture. This creates an entrance gate for bedding and feces, loaded with various microbial agents (Figure 10, Figure 11).
These residues migrate to the subcutaneous connective tissue, leading to the spreading of the inflammatory and infectious process, from the local level to the whole body. As a vital reaction of the body, the production of perilesional fibrin takes place, resulting in a delimitation of the lesion from the surrounding healthy tissues (Figure 12).

Figure 10. 26-week-old hen - the skin was torn and by opening the lesion remnants of litter penetrated to the subcutaneous tissue

Figure 11. 29-week-old hen with a wound on the side of her right thigh. Litter and feces have entered the subcutaneous level

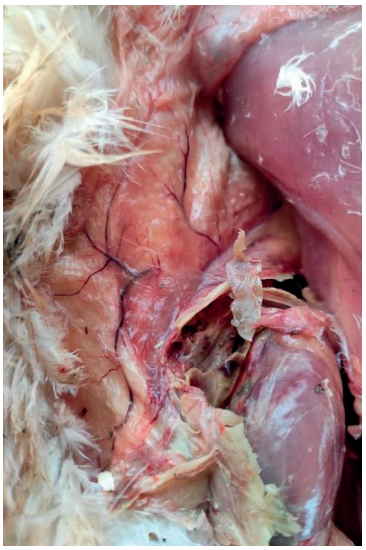

Figure 12. 30-week-old hen with a torso wound - perilesional fibrin deposition to the pectoral muscles is observed

The skin on the head or cervical area is torn apart by the beak of the roosters when they try to catch the hens to "step on" them.
Of the 15 cases examined in the study, 10 corpses showed extensive lesions and the remaining 5 corpses showed reduced lesions.
From the point of view of the age of the lesions, there are acute or chronic lesions. Of the 15 cases examined, 8 corpses had acute lesions, 5 corpses had chronic lesions and 2 corpses had both chronic and acute lesions.

The correlation between the age of the lession, extent, and the state of maintenance of the corpse

In the case of low-spread lesions, they become chronic and tend to heal. This type of lesion is usually found in the head area. These injuries, in most cases, do not result in the direct death of the birds. A predominance of chronic lesions were found in the head, in the case of cachectic corpses, with an inadequate state of maintenance. An explanation regarding this aspect is the following: the birds scared after the aggressive manifestation of the roosters, crowd towards the extremities of the breeding hall, avoiding in time to feed properly, this thing leading to their cachectic state.

In the case of acute, large-scale lesions, the death of birds occurs directly, either by hemorrhagic shock due to rupture of blood vessels, or by septic shock, due to the advancement of the infectious process in the body. In this situation, the state of maintenance of the corpses is good to very good (Table 2). The term "small" is characterized by low-spread wounds, which did not directly endanger the lives of birds.
The term "large" is characterized by very large wounds, which directly caused the death of birds either by hemorrhagic shock or septic shock.

Table 2. The correlation between the age and extent of the lesion and the state of maintenance

Cases	*Age of lesions*	*Extent of lesions*	*State of maintenance*
Case 1	Acute	Large	Very good
Case 2	Acute	Large	Very good
Case 3	Acute	Large	Very good
Case 4	Acute	Large	Very good
Case 5	Acute	Large	Very good
Case 6	Acute/chronic	Large	Good
Case 7	Chronic	Small	Inadequate
Case 8	Chronic	Small	Inadequate
Case 9	Chronic	Small	Inadequate
Case 10	Chronic	Small	Inadequate
Case 11	Acute	Large	Very good
Case 12	Acute	Large	Very good
Case 13	Chronic	Small	Inadequate
Case 14	Acute/Chronic	Large	Inadequate
Case 15	Acute	Large	Very good

The differences between aggression and cannibalism injuries

The literature defines cannibalism as an aberrant behavior, which is expressed by nibbling feathers and then the skin of other birds, in some cases reaching the almost complete consumption of an individual (Ioniță, 2014). In most cases, is determined by technological irregularities (Mitrănescu & Furnaris, 2012; Ioniță, 2014), but also some external parasitosis that causes birds to nibble their feathers, sometimes until the blood appears (Mitrea, 2011).
According to the definitions, cannibalism means the consumption of organs of an individual or parts of them by another individual of the same species. In the examined cases, the muscle masses are intact, with no signs of tissue deficiency. The only lesions were the tearing of the skin and the superficial scratches encountered in some cases on the muscular surface.
Comparatively, in Figure 14 is presented another case, where the specific signs of cannibalism can be observed. The intestinal mass of the bird was removed through the cloacal orifice, and part of it was consumed by the other chickens in the herd. Another case of cannibalism is shown in Figure 13. The lack of muscle mass in the preacetabular iliac region can be observed, which is consumed up to the bone level.

Figure 13. Case of cannibalism in a - the lack of muscles is observed, being highlighted the bone substrate

Figure 14. Case of cannibalism in the same population - the intestines extracted through the cloacal orifice are observed, which are partially consumed

Observing the behavior of birds

During the observation sessions, the following were found:
Failure of the specific courtship behavior by some roosters, resulting in forcing copulations.

Due to the lack of courtship, roosters no longer transmit their intention to mate chickens. For this reason, the hen is no longer adopting the squatting position, which then lead to males attacking them. They catch the skin of the cranio-cervical area with their beak, forcing them to climb on the backs of the females. In the hen's attempt to escape, specific lesions occur, or existing ones are aggravated; both in the head area and in the dorsal region of the trunk. The lack of courtship behavior of the roosters has been mentioned in the literature as one of the causes of aggressive manifestations of males (Millman et al., 2000). Fights between males have been observed, but in a normal level, without the hurting of the birds. Given the situation, one can discuss a sexual aggression and not an aggression based on dominance, because the identified and described lessions are produced during the mounting process and not from the competitive agression for resources.

The crowding of the chickens that show injuries in different evolutionary stages towards the extremities of the breeding hall in order not to come in contact with the aggressive males, which leads to the avoidance as time passes of food and water sources.

This manifestation could explain the cachexia of corpses with chronic injuries.

Inside the breeding hall there are chickens that show lesions in different stages (Figures 15 and 16).

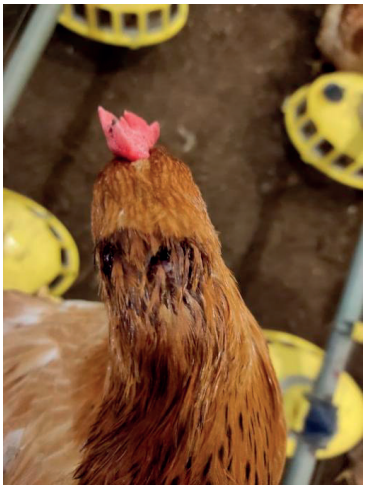

Figure 15. Live hen from the breeding hall with an acute cranial lesion

Figure 16. Live hen from the breeding hall with a chronic cranial lesion

The literature mentions as a cause of the lack of courtship behavior, the genetic over selection, focusing on the increased productivity of hybrids (Millman et al., 2000).

CONCLUSIONS

Following the aggressive behavior of roosters, the main locations of the lesions are: the head region and the dorsal region of the trunk. Some cases showed lesions both in the cranial region and on the dorsal area of the trunk.

A correlation was established between cachectic corpses and the presence of chronic, small lesions on them. Corpses with good or very good condition showed acute, large lesions.

The lesions produced as a result of the aggressive phenomenon are clearly differentiated from the lesions encountered in the case of cannibalism, in the same flock of hens.

In the present study, the cause of the aggressive behavior and the appearance of the described lesions is the lack or very weak expression of the specific courtship behavior of the roosters.

The lesions described are not specific to dominance fights, but indicate a phenomenon of sexual aggression.

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