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AGE-RELATED EPIZOOTOLOGICAL CHARACTERISTICS OF COLIBACILLOSIS IN LAMBS.

Islomova Ozoda Payzullayevna
Independent researcher

Abstract: This scientific research study studied the age-related epizootological characteristics of colibacillosis in lambs. The studies were conducted on large sheep farms in Samarkand, Surkhandarya and Navoi regions, and the dynamics of the spread of the disease by age were analyzed. The results showed that colibacillosis is most common in the first 15 days of lambs' life, and this period is considered the epizootic peak of the disease. In the period of 15–30 days, the incidence rate decreased by 2–7 times, which is explained by the formation of acquired immunity in lambs. The highest incidence of the disease by region was recorded in Surkhandarya (78.46%), Navoi (61.41%) and Samarkand (57.69%). The results of the study scientifically confirmed the high susceptibility of lambs to the disease in the first two weeks of life, weak immunity and the importance of sanitary and hygienic conditions. These results will serve to improve disease prevention strategies by identifying age-specific patterns of colibacillosis spread.

Key words: lambs, colibacillosis, age factor, epizootological characteristics, E. coli, distribution dynamics, immunity, sanitary and hygienic conditions, epizootic risk period, prevention.

Introduction. Among infectious diseases of animals, diseases of bacterial etiology, characteristic of young animals, including colibacteriosis, are one of the most important factors causing economic damage in the livestock industry. Lamb colibacteriosis (Escherichia coli infection) is characterized by high mortality, rapid spread, and epizootic instability. Severe forms of the disease not only disrupt the vital activity of animals, but also significantly reduce the production of milk, meat, and other products. Therefore, colibacteriosis is an urgent problem that requires constant control in veterinary medicine and the food safety system.

Studies show that colibacteriosis in lambs is most often observed in the newborn period - when the animal's immune system is not yet fully formed, and the intestinal microbiota is in an unstable state. A temporary decrease in maternal immunity, insufficient absorption of immunoglobulins in colostrum, and variability of the external environment significantly affect the development of the disease. At the same time, the course of the disease changes with age - initially it manifests itself with acute diarrhea, then subclinical or chronic forms are noted in the later stages. Observations conducted in various natural and climatic conditions of Uzbekistan confirm that the age factor plays an important role in the dynamics of the spread of colibacillosis.

In particular, newborn lambs (0–15 days old) are most susceptible to the disease, and the incidence rate can reach 80–90%, while in the period of 1–3 months this indicator is significantly reduced. Identifying these age-specific epizootological differences, analyzing them in relation to the mechanisms of pathogenesis of the disease, and developing preventive measures appropriate for age groups is one of the areas of scientific and practical importance for practical veterinary medicine today.

The main cause of the factors that cause diseases in newborn animals is the violation of the compatibility between the body's resistance and the environment. Animals are usually born with

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sterile gastrointestinal and respiratory organs, but upon initial contact with the external environment, they can be infected with various microorganisms. Not only pathogenic microorganisms negatively affect the newborn organism, but also conditionally pathogenic microorganisms have a harmful effect as pathogens of infectious diseases when the body's immune system is weakened [8; p. 24].

This disease mainly affects lambs in the first 1-5 days of life, in some cases the disease can occur in the first hours after birth. It has been observed that more than 94-95% of the disease occurs in the first days after birth. The incubation period of colibacillosis in lambs is very short, lasting from several hours to 1-2 days, depending on the individual natural resistance of each organism, storage conditions, and the concentration of the pathogenic E. coli strain in the body [6; pp. 304-307, 7; pp. 51-54].

Mortality in newborn lambs is associated with infectious (E. coli enteritis, rotavirus/coronavirus, Clostridium perfringens, Cryptosporidium, etc.) and non-infectious (malnutrition, cold-humid weather stress, storage and hygiene violations) factors, and the greatest losses occur in the neonatal period [5; pp. 43–48]. In Rajasthan (India), a sharp increase in neonatal diarrhea, accompanied by clinical and hematobiochemical disorders, was noted against the background of a hot-humid environment and poor hygiene during the rainy season [1; pp. 95–98]. Other scientific sources also confirm that colibacillosis and other enteric infections are the leading cause of losses in small cattle in the 1–4 week period [2; pp. 22–31].

According to the literature review, colibacillosis in lambs occurs mainly in the first days after birth, when the immune system is not sufficiently formed, with high susceptibility. The incubation period of the disease is short and depends on the amount of the pathogenic strain and storage conditions. Insufficient absorption of colostrum and violation of hygienic requirements in the neonatal period increase the risk of infection. Studies show that the spread of the disease is closely related to climate, age and environmental factors, and the incidence rate increases especially in hot and humid conditions. Therefore, a thorough study of age-related epizootological factors is important in improving disease prevention.

The purpose of the study is to study the age-related epizootological characteristics of colibacillosis in lambs, to determine the frequency of occurrence, clinical course and distribution patterns of the disease at different age periods

1. To study the dynamics of the age-related spread of lamb colibacillosis, that is, to compare the incidence, severity and clinical course in age groups 0–10 days and 10 days to 1 month:

2. To identify age-related epizootological differences in lamb colibacillosis in different natural-climatic and economic conditions, to compare and evaluate the prevalence indicators of the disease (percentage, duration, epizootic density) by age groups.

Research materials and methods. Conducted on sheep farms in Samarkand, Jizzakh, Navoi and Surkhandarya regions. To apply the results in practice, 250 sheep and lambs were tested at the "Aq uchar tulpor" farm in Nurabad district of Samarkand region, 100 heads of Khissori sheep and lambs at the "Novbod geldi" farm in Orol mahalla of Termez district of Surkhandarya region, 22 thousand heads of Karakul sheep and lambs at the "Bozorov sururi" farm in Kumkurgan district, 303 heads at the "Adizbobo" farm in Kiziltepa district of Navoi region, 70 heads at the "Muftilbobo 101" farm in Nurota district, and 100 heads at the "Gayrat Jonibek" farm in Uchkuduk district, a total of 22,854 sheep and lambs.

Epidemiological data were obtained from the owner of the farm where the disease was registered or from the veterinarian, general and special clinical examinations were conducted to study the clinical status of lambs, in addition, pathological samples taken with suspicion of infectious diseases, including colibacteriosis, were sent to the laboratory for examination.

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The epidemiological situation of lamb colibacteriosis in the Samarkand, Jizzakh, Navoi and Surkhandarya regions, where the study was conducted, was studied using generally accepted methodologies. The epidemiological situation of lamb colibacteriosis in these regions was analyzed based on statistical indicators, taking into account the technology of farming and management methods, based on veterinary statistical data and analysis of private research.

The studies were carried out on the basis of methodological manuals, instructions and guidelines approved by the Committee for the Development of Veterinary Medicine and Livestock of the Republic of Uzbekistan.

Epizootological observations were carried out using comparative-historical and comparative-geographic methods and studied in the cross-section of conditionally healthy and unhealthy foci. In order to determine the seasonal dynamics of the disease, observations were conducted in spring, summer, autumn and winter; in order to determine age-related characteristics, different age groups of lambs (from newborns to adults) were observed epizootologically, and the prevalence of the disease and the characteristics of clinical signs were assessed.

Results and their analysis. During our research, the age-related dynamics of lamb colibacillosis in these farms were studied. In this case, the incidence of disease in lambs aged 1–15 days and 15 days to 1 month was compared. The research was conducted on large sheep farms in Samarkand, Surkhandarya and Navoi regions.

Table 1 shows age-related differences in the incidence of disease among lambs, including the relatively high incidence in the 1–15-day period, the main reasons being the insufficient formation of passive immunity in newborn lambs, insufficient transfer of immunoglobulins with colostrum, and faster susceptibility to external environmental influences. In the period from 15 days to 1 month, the incidence rate decreased slightly, but it was observed that it remained at high percentages in cases of insufficient sanitary and hygienic conditions.

In 2022–2024, a total of 22,854 sheep and lambs were examined in sheep farms in Samarkand, Surkhandarya and Navoi regions, of which 148 were infected with colibacillosis. Of these, 101 (68.24%) were found to be infected with colibacillosis in lambs aged 1–15 days, and 47 (31.76%) in lambs aged 15 days to 1 month.

These results show that the protective system of the lambs' body (colostrum immunity, innate resistance) is very weak in the first days, and resistance to infection is low. Over time, conditioned immunity is formed in lambs and the incidence rate decreases. Therefore, the main dangerous period for the disease is the first two weeks of life.

If we consider the situation in each region, in the farm "Oq uchar tulpor" of Nurabad district, Samarkand region, out of 26 infected lambs, 15 (57.69%) were infected in the period from 1 to 15 days, and 11 (42.31%) in the period from 15 days to 1 month. The results show that there is a difference between age groups, but not a significant difference (15.38%). This means that in the conditions of the Samarkand region, colibacillosis poses a significant risk to lambs from the moment they are born, but the incidence has not completely decreased even after 15 days.

Table 1

Age-related dynamics of lamb colibacillosis

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T/R	Farm (region, district)	Total number of lambs inspected (head)	Number of infected lambs (head)	Disease status			
				1–15 days		15–30 days	
				Number (head)	Incidence rate (%)	Number (head)	Incidence rate (%)
1	Samarkand, Nurabad, White-tailed Vulture	250	26	15	57,69	11	42,31
Total by region:		**250**	**26**	**15**	**57,69**	**11**	**42,31**
2	Surkhandarya, Termez, Navbad came	108	26	17	65,38	9	34,62
3	Surkhandarya, Kumkurgan, Bazarov mountain range	22 000	39	34	87,18	5	12,82
Total by region:		**22 108**	**65**	**51**	**78,46**	**14**	**27,45**
4	Navoi, Kyzyltepa, Adizbaba	303	18	11	61,11	7	38,89
5	Navoi, Nurota, Muftilbabo 101	70	14	9	64,29	5	35,71
6	Navoi, Uchkuduk, Gayrat Jonibek	123	25	15	60,00	10	40,00
Total by region:		**496**	**57**	**35**	**61,41**	**22**	**38,59**
Total:		**22 854**	**148**	**101**	**68,24**	**47**	**31,76**

In the “Novbod geldi” farm, Termez district, Surkhandarya region, out of 26 infected lambs, 17 (65.38%) were infected in the period from 1 to 15 days, and 9 (34.62%) in the period from 15 to 30 days. This is one of the highest indicators, as the incidence of lambs was very high in the first 15 days and decreased more than twice in the subsequent period. This means that the disease was most often recorded in the first stage due to poor sanitary and feeding conditions on this farm, and insufficient colostrum immunity.

In the “Bozorov Sururi” farm of the Kumkurgan district of this region, out of 39 infected lambs, 34 (87.18%) were infected in the age group of 1–15 days, and 5 (12.82%) in the age group of 15 days–1 month. The highest rate was recorded among lambs in these farms, and most cases of infection in lambs were recorded in this two-week period. In the period from 15 to 30 days, 7 times less cases were recorded in the first two weeks of life. Thus, due to the very poor sanitary and feeding conditions on this farm and insufficient colostrum immunity, the disease was most often recorded in the first stage.

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In the "Adizbobo" farm of the Kyzyltepa district of Navoi region, out of 18 infected lambs, 11 (61.11%) were infected in the age group of 1–15 days, and 7 (38.89%) in the age group of 15–30 days. Thus, the incidence of disease between age groups also varies significantly in this farm, with almost two-thirds of the total incidence of disease occurring in lambs of this age group. Also, in the "Muftilbobo 101" farm of the Nurota district, out of 14 infected lambs, 9 (64.29%) were infected in the age group of 1–15 days, and 5 (35.75%) in the age group of 15 days to 1 month. In this farm, the age-related incidence of colibacillosis was 2 times higher in the first 15 days than in the next 15 days. Such indicators are caused by non-compliance with sanitary and hygienic rules in the lambing department of the farm or the complete absence of this department, as well as the birth of lambs with low viability from immune-weakened dams.

In addition, in the "Gayrat Jonibek" farm of Uchkuduk district of Navoi region, out of 25 infected lambs, 15 (60%) were infected between 1 and 15 days of age, and 10 (40.0%) between 15 and 30 days of age. In this farm, the incidence is also high in the first 2 weeks of age and does not significantly decrease after 15 days. The risk of colibacillosis in this farm remains constant, but the main sensitive period falls on the first 15 days.

In general, if we pay attention to inter-regional differences, the highest disease rate was observed in Samarkand (57.69%), Surkhandarya (78.46%), and Navoi (61.41%) in the period 1–15 days. The situation in the farms of Navoi and Samarkand regions is almost similar, and in the farms of Surkhandarya regions, it is necessary to prevent the death of lambs under 15 days of age from getting sick. In the period from the last 15 to 30 days, 42.31% of the cases of illness were recorded in Samarkand, 27.45% in Surkhandarya, and 38.59% in Navoi, which is associated with the increased immunity acquired by the lambs by this period.

The results of the conducted studies showed that the highest incidence of colibacillosis in lambs is recorded mainly in the first 15 days of life. In the analyzed farms, lambs aged 1–15 days accounted for 60–87% of the total number of cases, and this period was considered the epizootic peak of infection. After 15 days, the incidence rate decreased by 2–7 times, and a significant decrease was observed by the 30-day period. This is explained by the fact that the immunity developed in the first two weeks of life of lambs has not yet been fully formed, and the risk of infection is high in farms where sanitary and hygienic requirements are not observed.

Discussion of the results. The literature notes that the incidence of colibacillosis among lambs is often directly related to the age factor. According to researchers, the disease is most often manifested in the first days of life, that is, in the period of 0–10 days. This is because during this period, passive immunity in the lambs' bodies is not yet fully formed, and immunoglobulins transmitted through colostrum may not be in sufficient quantity or of poor quality [4; pp. 1491–1495]. Therefore, the intestinal epithelium in young lambs is sensitive to infectious pressure, as a result of which diarrhea develops rapidly and is severe [3; pp. 237–241].

Conclusions. As a result of the studies conducted, it was noted that 101 of the 148 infected lambs, or 68.24%, were lambs up to 15 days old, and the remaining 47, or 31.76%, were lambs from 15 to 30 days old, proving that the disease occurs more frequently in the first 15 days of lambs.

The highest incidence of the disease was observed in the period from 1 to 15 days, with 57.69% in Samarkand, 78.46% in Surkhandarya, and 61.41% in Navoi, and 42.31% in Samarkand, 27.45% in Surkhandarya, and 38.59% in Navoi, respectively, in lambs from 15 to 30 days old. These results confirmed that the first 15 days of lamb life are the most dangerous period from an epizootic point of view in all regions studied.

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