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BACTERIOLOGICAL STUDIES OF SALMONELLOSIS

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Abstract
The article describes salmonella infections that are common among Karakul sheep. Pathological changes are found mainly in the gastrointestinal tract, liver, lymph nodes and respiratory organs. To prevent salmonella infection, it is advisable to use an associated vaccine. In response to the introduction of the UzNIVI associated vaccine against salmonellosis, the body responds by producing specific antibodies against the infection, which causes the formation of intense immunity.

Keywords: Salmonella infection, bacteriological studies, lambs, ewes.

Introduction

Salmonellosis affects farm and wild animals of various species, mainly young animals, and is characterized by a wide carriage of bacteria, causing severe toxic infections in humans. In the structure of morbidity of all zoonoses of farm mammals and birds, salmonellosis accounts for 15-45% [1; 3; 8].

The modern taxonomy of representatives of the genus Salmonella includes more than 2500 serovars, united into 52 serogroups. However, in farm animals, the disease is caused by certain adapted serovars of salmonella, in particular, in calves - S. dublin, sheep - S. abortusovis [4].

The main clinical sign of salmonellosis in adult sheep is abortion, usually in the last third of pregnancy. Abortions are complicated by retention of the placenta, endometritis, often ending in the death of the ewes. Lambs become ill in the first days and weeks after birth. Sometimes 2–3-month-old well-developed lambs become ill [5; 7; 9].

The fight against salmonellosis includes a set of measures in which a significant role is given to vaccination. Over the past decades, researchers have successfully used advances in the study of bacterial genetics to obtain vaccine strains with consistently reduced virulence and improved immunogenic properties [2].

Methods

Salmonella is a microorganism widespread in nature and the animal environment. The objects of the study were lambs that died from salmonellosis, an aborted fetus, and sheep. For this purpose, two methods were used: statistical - analysis of the detection of salmonella in livestock products; microbiological method in accordance with GOST R 52814-2007 (ISO 6579:2002) "Food products. Method for detection of bacteria of the genus Salmonella" and guidelines [6].

Research Results

According to our long-term research, the disease was observed in lambs in the first days of life up to 20 days of age and more. In sheep, the disease was accompanied by abortions in the second half of pregnancy, more often in the winter-spring months, pre-lambing and lambing periods.

The disease was accompanied by septicemia, subacute or chronic course, inflammation of the gastrointestinal tract and damage to the respiratory organs.

In the sheep farms examined, the disease in some cases affected mainly pregnant ewes, in others - young animals, in others - all sheep.

The disease was more often enzootic, affecting a significant number of susceptible animals. But with various disorders that created favorable conditions for the development of the disease, salmonellosis was widespread in many farms. Salmonellosis is especially dangerous for pregnant ewes in the pre-lambing period of 1-1.5 months before lambing, when the disease is accompanied by mass abortions, severe postpartum complications and high mortality among aborted ewes. In addition to abortions, significant damage was also caused by the birth of dead and underdeveloped lambs during the lambing period. In lambs in the first 15 days of life, the disease was severe with septic phenomena and was characterized by an increase in body temperature to 42^{o}C, depression, they refused to suckle ewes, often breathed, lay down more, they developed diarrhea and died.

In older lambs, a less acute course was observed, with arthritis and swelling of the joints. However, with such a course, death is common.

During the pathological examination of sheep, edema of the subcutaneous tissue and muscles in the neck and brisket area, the presence of blood fluid in the chest and abdominal cavities, an enlarged heart and flabbiness of its muscle with the presence of pinpoint hemorrhages on the endocardium and pericardium, softening of the kidneys, enlargement and softening of the spleen and liver, inflammatory phenomena on the mucous membrane of the abomasum, small and large intestines were observed. In sheep that died after abortion and retention of the placenta. Inflammation of the uterus with areas of necrosis was detected.

The data from the study of pathomorphological changes allow us to conclude:

1. In lambs that fell ill and died from salmonellosis, the main pathological changes are localized in the gastrointestinal tract and are characterized by inflammation, which is especially pronounced in the large intestine.

In most cases, pinpoint and spotty hemorrhages are observed on all serous covers, under the epicardium and on the endocardium.

In the body of lambs, along with the septic process, hepatitis, nicrotizing nephritis, hemorrhagic splenitis and lymphadenitis, as well as desquamative catarrh of the ileum develop.

2. Lambs that died in the acute course of salmonillosis show changes characteristic of a septic process, accompanied by hemorrhagic diathesis with the presence of hemorrhages on the serous coverings of the parenchymatous organs on the mucous

membrane of the rumen and intestines, sharp reddening of the rumen walls and their swelling, and enlargement of the lymph nodes.

The kidneys are dark in color, often in a state of congestive hyperemia, there is slight edema on the section, the border between the cortex and medulla is well defined. The capsule is easily removed.

In subacute and chronic salmonillosis, the most characteristic pathological changes were noted in the large intestine, where diphtheritic inflammation of the mucous membrane with necrosis of the follicles and often with ulcerations was observed.

The most pronounced changes were in the cecum. The mucous membrane of the cecum was often necrotic and represented a gray, crumbly mass, covering a significant surface of the intestine from the inside with a thick layer, while the necrotic masses were separated with difficulty. The submucosal layer in such cases was significantly thickened.

Most lambs had catarrhal or fibrous bronchopneumonia.

The diagnosis of salmonellosis was established taking into account clinical, epizootological, pathological, serological and bacteriological studies, with special attention to bacteriological studies, with the isolation of salmonella and the study of their biological properties.

Table 1 presents the results of bacteriological studies of pathological material from sheep that died due to salmonellosis.

Table 1. Results of bacteriological studies of pathological material from sheep that died due to salmonellosis

№	Name of districts	Object of study	Number of animals studied	Total number of strains isolated	Attributed to the species Salmonella abortus ovis
1	Gallyaaral Galyaaral	sheep	10	8	+
		abortion. fetus	10	8	+
		lambs	12	8	+
2	Panjakent	sheep	6	4	+
		abortion. fetus	4	4	+
		lambs	8	4	+
3	Sherabad	sheep	6	3	+
		abortion. fetus	5	3	+
		lambs	8	3	+
4	Zerafshan Chirakchin	sheep	6	-	-
		abortion. fetus	6	-	-
		lambs	4	3	-
5	Koshrabad	sheep	6	4	+
		abortion. fetus	6	2	+
		lambs	3	2	+
6	Kamashin	sheep	5	2	+
		abortion. fetus	5	3	+
		lambs	8	2	+
7	Koshrabad	sheep	4	2	+
		abortion. fetus	4	2	+
		lambs	5	2	+
X		sheep	49	27	
		abortion. fetus	45	24	
		lambs	51	25	

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Studies of pathological material, their corpses of sheep and lambs that died with signs of salmonellosis isolated cultures attributed to Salmonella abortus ovis.

Salmonella abortus ovis - short, small rods with rounded edges, often oval in shape. According to Gram stained negative, grew well on artificial nutrient media in aerobic and anaerobic conditions at an optimal temperature of 35 - 38°C and pH - 7.2 - 7.6 spores and capsules did not form.

On MPA they grew as translucent, bluish-tinted, convex, moist colonies with a wavy surface.

In MPB they caused uniform turbidity of the medium, did not form indole, did not liquefy gelatin.

On Endo medium - as transparent colorless colonies, on Ploskirev's baktagar the colonies were golden, on a non-bromothymol medium - green-blue. In a medium with glucose they formed gas, decomposed mannitol, xylose, formed hydrogen sulfide. They did not decompose lactose, sucrose, inositol; they did not curdle milk, did not form indole, did not liquefy gelatin, did not break down glycerol broth and a medium with rhamnose.

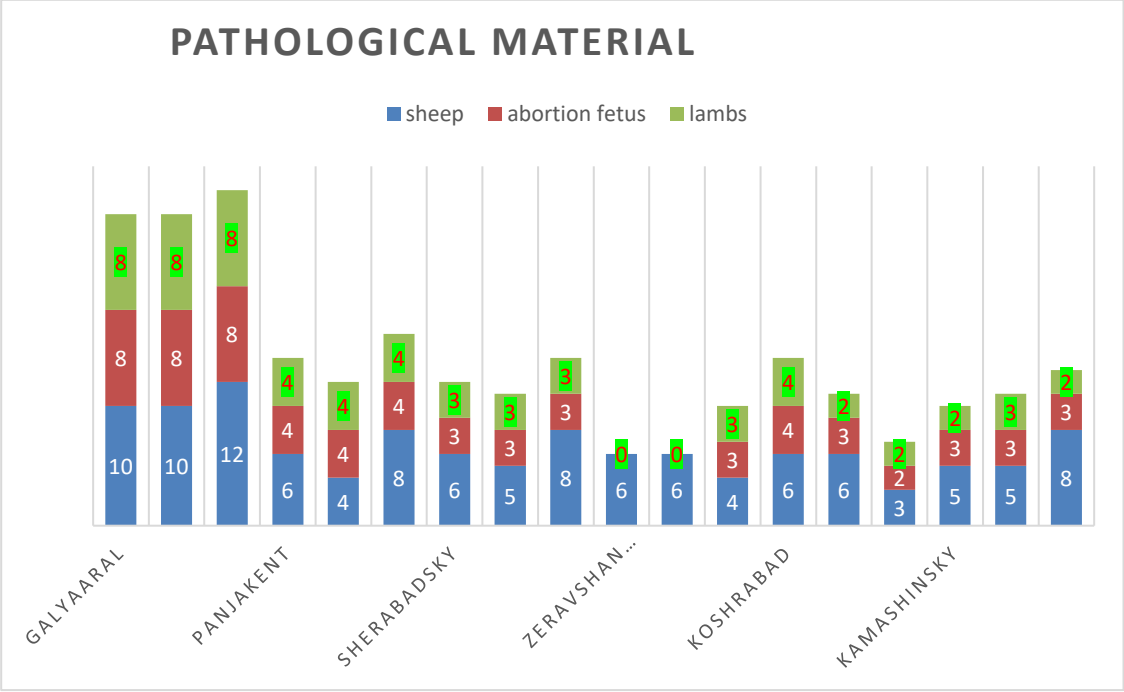

Fig. 2. Number of animals and isolated salmonella

As can be seen from Table 1, pathological material from 145 animals with signs of salmonellosis was subjected to bacteriological studies. Salmonella were isolated in 79 cases. Including from 28 sheep corpses, 25 - aborted fetuses and from 26 lambs.

All isolated salmonella cultures belonged to one species - Salmonella abortus ovis. All isolated strains were pathogenic for white mice, however, those isolated from aborted fetuses were more pathogenic with high virulence.

Conclusions

Salmonella infections are common among Karakul sheep. Pathological changes are found mainly in the gastrointestinal tract, liver, lymph nodes and respiratory organs. To prevent salmonella infection, it is advisable to use an associated vaccine. In response to the introduction of the UzNIVI associated vaccine against salmonellosis, the body responds by producing specific antibodies against the infection, which causes the formation of intense immunity.

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