UDK: 619:636.31:595.42:616.9:616.084:616

EPIZOOTOLOGY, TREATMENT, AND PREVENTIVE MEASURES OF ECTOPARASITIC INFESTATIONS IN SHEEP

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Abstract: This article describes the distribution of ectoparasites in sheep in selected districts of Navoi Region, as well as measures for their prevention. In Karakul sheep breeding, which constitutes an important branch of animal husbandry, ectoparasites are among the major factors limiting increases in flock size and adversely affecting the physiological condition of sheep.

Key words: USD 100 million, regional administrations, distribution of 350,000 sheep.

Introduction.

On February 16, 2022, the President of the Republic of Uzbekistan held a meeting devoted to support for the livestock sector and to increasing the production of meat, milk, and eggs through the broad introduction of advanced technologies. Particular attention was also paid to the issue of providing the population with livestock animals. During the meeting, instructions were issued to begin, within ten days, the distribution of 350,000 sheep and goats to the population on the basis of cooperation. This directive has since been implemented across districts and settlements specialized in sheep breeding. The state allocated USD 100 million for this purpose. Sector officials, together with regional and district authorities, were also tasked with initiating the establishment of 67 large sheep- and goat-breeding farms within one week. In addition, it was emphasized that, in 2022, regional administrations were required to provide employment for 150,000 people through the development of Karakul breeding, sheep breeding, goat breeding, and the wool industry.

Relevance of the Topic

Ticks are among the most widespread ectoparasites found in livestock farms, and if diagnosis and treatment are not carried out in a timely manner, they can cause substantial economic losses. The highest levels of ectoparasitic infestation in sheep are observed during winter and spring, whereas infestation rates decline during summer and autumn. The intensity of ectoparasitic infestation in sheep is reported to range from 45% to 65% in winter, 85% to 100% in spring, 15% to 25% in summer, and 25% to 35% in

autumn.

When sheep affected by ectoparasites are kept together with healthy animals, infestation spreads rapidly to the healthy flock, thereby increasing the number of affected sheep. Under such conditions, lambs are generally more severely infested than adult sheep. Over recent years, the number of sheep and lambs has nearly doubled, sheep breeds have been improved through scientific research, and new varieties of desert forage crops have been developed. Nevertheless, in recent years, certain parasitic diseases, especially ectoparasitoses, have negatively affected the rapid development of the sheep-breeding sector.

Aim of the Study

To investigate the epizootic status of ectoparasitic infestation among sheep and lambs raised in Nurota District, Navoi Region, and to improve treatment and preventive measures against these infestations.

Materials and Methods

The study was conducted on sheep and lambs of various ages, spontaneously infested with ectoparasites, in household subsidiary farms, peasant farms, farmer enterprises, and at “Nurota Qorako‘l Naslchilik” LLC located in Nurota District, Navoi Region. Ticks collected from infested sheep were examined microscopically.

Current State of Knowledge on the Problem

Veterinary arachnology studies mites and ticks belonging to the phylum Arthropoda and the class Arachnida, including the groups Parasitiformes and Acariformes. Although the body of ticks appears externally fused, the source text describes it conventionally as consisting of head, thoracic, and abdominal regions. Sexually mature ticks possess four pairs of legs, whereas larvae have three pairs. In Parasitiformes, no distinct boundary is observed between the anterior and posterior parts of the body. Parasitiformes is divided into the subgroups Ixodoidea and Gamasoidea. The superfamily Ixodoidea includes the families Ixodidae and Argasidae. Gamasoidea comprises numerous families, among which Dermanyssidae is of major veterinary importance.

Ticks are dioecious organisms that reproduce by oviposition. A single female tick may lay from 3,000-4,000 to 10,000-15,000 eggs during its lifetime. The eggs are very small, oval in shape, and yellowish in colour. After engorging on the blood of the host animal, the fertilized female drops to the ground and begins laying eggs; once oviposition is complete, it dies. Larvae hatch from the eggs, moult into nymphs, and then moult again into sexually mature adults (imagines). Embryonic development of larvae lasts approximately one month or longer, while transformation into nymphs and

adults may take from several days up to one month. Depending on the developmental stage, the blood-feeding period lasts from 3 to 10 days: 3-7 days in larvae, 3-10 days in nymphs, and 8-10 days in adults.

The body is oval or elliptical and unsegmented. The size and colour of pasture ticks depend on their feeding status: unfed ticks are flattened and elongated, whereas fully engorged ticks become egg-shaped. Engorged ticks may reach up to 1.5 cm in length, while unfed ticks measure 2-7 mm. Unfed ticks may be light yellow, yellowish-brown, dark brown, or even black, depending on the degree of engorgement and the nature of their feeding. The capitulum is clearly visible on the dorsal side of the tick body and functions as both the feeding and attachment apparatus. It consists of a pair of chelicerae, a hypostome, a four- or six-angled basis capituli, and palps. According to B. Sayidqulov and other researchers, 24 tick species parasitize domestic animals and poultry in Uzbekistan; if species parasitizing wild animals are included, the total number reaches 29.

According to S.I. Mavlonov and co-authors, the highest level of ectoparasitic infestation in sheep occurs during winter and spring, whereas lower infestation levels are recorded during summer and autumn. In winter, the prevalence of infestation is 45%-65%, with an average intensity of 15-40 ectoparasites per animal. In spring, prevalence reaches 85%-100%, with an intensity of 55-70 ectoparasites; in summer, prevalence declines to 15%-25%, with an intensity of 15-20 ectoparasites; and in autumn, prevalence is 25%-35%, with an intensity of 5-10 ectoparasites. The prevalence and intensity of ectoparasitic infestation vary depending on season, climate, farm sanitary conditions, livestock-management systems, and numerous other ecological factors.

Research Methods and Results

Our investigations were conducted in Nurota District, Navoi Region. Experimental, microscopic, and statistical methods were employed. Sheep and lambs infested with ticks were identified, separated from the flock, and the ticks were collected in специальные containers. Their biology, epizootology, clinical manifestations, treatment, and preventive measures were subsequently analysed.

Because infested sheep were kept together with healthy animals, infestation spread very rapidly, resulting in an increase in the number of affected sheep. During the course of the study, it was established that lambs were more severely affected than adult sheep.

Our observations showed that tick mouthparts irritated the skin receptors, causing pruritus. As a result, lambs injured the affected areas with their teeth, leading to wound formation and moistening of the skin with

saliva. This, in turn, created favourable conditions for the development of primary psoroptic lesions. Toxins introduced into wounds through tick saliva caused inflammation of the skin; lymph accumulated on the surface, gradually thickened, and, together with dead epidermal cells, formed crusts. Pyogenic microorganisms then penetrated and began to develop in these lesions. Ticks and their waste products intensified the inflammatory process in the skin and adversely affected the general condition of the organism. As products of cell lysis, metabolic by-products, and microbial toxins were absorbed into the body, eosinophilia and other hemodynamic disturbances developed.

Diagnosis is established on the basis of characteristic clinical signs and the detection of ticks. In suspected or subclinical cases, laboratory examination is mandatory.

During the study, treatment and preventive measures against ectoparasites were carried out in the flocks of “Nurota Qorako‘l Naslchilik” LLC. For the elimination of ectoparasites, antiparasitic drugs such as ivermectin, Ivomec, Sidectin, Santomectin, and Baymec were administered subcutaneously at a dose of 0.2 ml per 10 kg of live body weight (equivalent to 0.2 mg ivermectin per 1 kg body weight), twice at one-week intervals. In addition, topical preparations such as Deltapur-10 and Amitraz-125 were used purposefully. These preparations were reported to be effective against ectoparasites, blood-sucking lice, and the larval and adult stages of sarcoptoid mites.

Conclusions

It should be emphasized that ectoparasite control must be implemented continuously, comprehensively, and on the basis of a precise and systematic plan. Invasive infestation can be effectively prevented only when control measures are developed with due regard to the specific characteristics of each geographical and climatic zone, including local relief, weather conditions, water availability, vegetation, soil salinity, and other environmental factors.

At present, it is advisable to use scientific achievements and advanced innovative technologies in combating economically significant infectious and non-infectious diseases, as well as ectoparasitic infestations. In particular, it is necessary to identify the principal ectoparasites of sheep and to implement treatment-and-prevention measures in a timely and high-quality manner in accordance with established control plans. In carrying out these measures, group deacarization methods should be widely and effectively applied.

According to published data, substantial work has already been

undertaken to control and prevent ectoparasites that cause significant economic losses in the sheep-breeding sector. However, given the biological characteristics of parasites and the rapid changes occurring in climatic zones, the use of insectoacaricidal preparations with low toxicity and high efficacy remains one of the urgent tasks of the present day.

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