

# Seasonal Dynamics of Goats' Infestation with *Bovicola Caprae*

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**Annotation:** This article provides detailed information on determining the seasonal degree of infestation of goats with *Bovicola caprae* in goat farms across the Republic.

**Keywords:** Bovicollosis, entomosis, seasonal dynamics, goat, *Bovicola caprae*, ectoparasite, goat farms.

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## Introduction

Today, due to the continuous growth of the population, the demand for and daily need of people for food products are also increasing. In order to supply the population with agricultural products rich in protein, it is essential to establish the production of dietary goat milk and meat, develop goat breeding as one of the most profitable and productive branches of livestock, and prevent their infestation with various ectoparasitoses.

However, one of the ectoparasitic diseases widely spreading among goats *bovicollis* has become a serious obstacle to the development of goat farming. Goats affected by *bovicollis* exhibit severe restlessness, hair loss, skin inflammation, weight loss and decreased immunity. As a result, their productivity declines and young goats lag behind in growth and development.

In our Republic, a total of 3,263 sheep and goats are breeding enterprises have been established. In accordance with the instructions of the Head of State, a pedigree goat-breeding cluster has been created by importing high-yield goat breeds from Turkey and Russia in order to improve the breed composition and increase the productivity of local goats. Furthermore, directives have been given to establish the production and export of cashmere and mohair products through the processing of goat wool.

To successfully implement these objectives, it is of great importance to protect goats from ectoparasites, which cause significant economic losses in the development of goat breeding.

**Research Objective.** To determine the seasonal degree of infestation of goats with *Bovicola caprae* in goat-breeding farms.

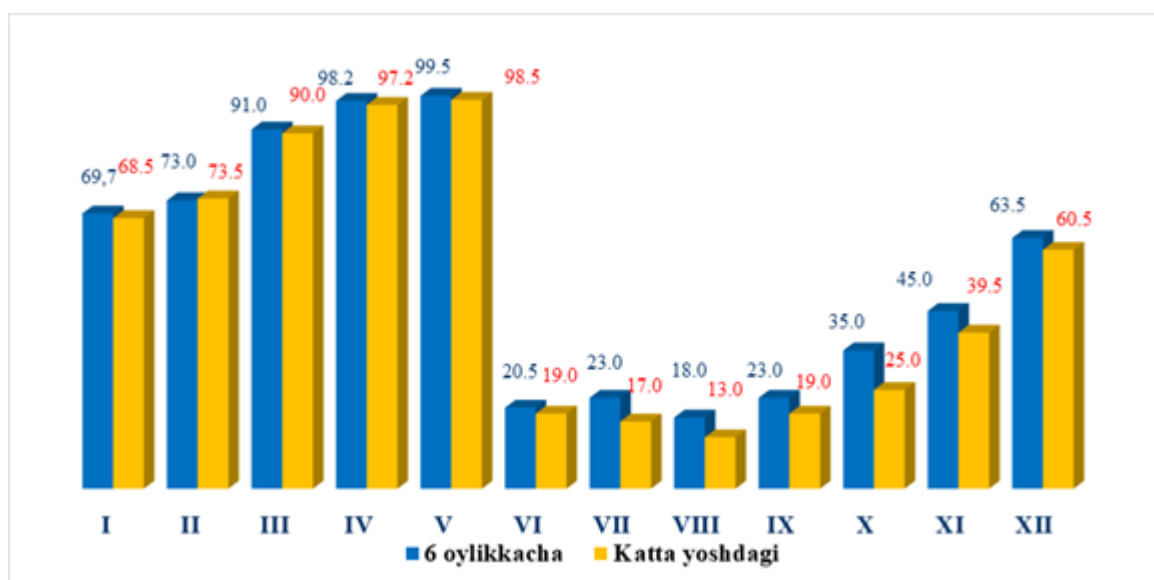
**Research Results.** Scientific research works were carried out on 80 goats of “Chavandoz” farm, 65 goats of “Khudoyqulov F.I.” farm, 82 goats of “Jamshid” farm, 230 goats of “Nurobod Karakul Breeding” farm located in Nurabod district of Samarkand region; 810 goats of “Andijon Pedigree Goats” farm in Oltinko‘l district of Andijan region; 92 goats of “Pahtakor-Tamorqa-Xizmati 2022” farm, 65 goats of “Imo Money Chang” farm, 72 goats of “Inmarka Lyuks” farm located in Andijan district; and 2000 goats of “Nurota Karakul Breeding” livestock farm located in Nurota district of Navoi region.

Goat *Bovicola* is a permanent, stationary parasites, meaning they live as constant ectoparasites on the host's body. therefore, they were observed on goats of all age groups throughout all seasons of the year. However, the degree of infestation both in terms of extensiveness and intensity varied depending on the age of the goats, the season, climatic and geographical conditions, livestock management systems, and various ecological factors. Consequently, the epizootiology and seasonal patterns of the disease *bovicollis* manifested in different forms.

As a result of epizootiological examinations, it was determined that the appearance time and the degree of infestation of *Bovicola* on the bodies of goats depend on livestock management practices and the sanitary condition of pens and goat shelters. In the “Chavandoz” and “Khudoyqulov F.I.” livestock farms, due to poor sanitary conditions and unclean maintenance of goats, infestation began as early as January, affecting 40% of goats. In “Jamshid” and “Nurota Karakul” livestock farms of Nurota district, the infestation rate was 20%, while in “Andijon Pedigree Goats” farms, due to relatively better sanitary conditions, infestation with *bovicollis* started later — from the first decade of February.

Therefore, the epizootology of *bovicollis* in goats was studied over a period of 3 years, with examinations conducted every 15–20 days. From each herd, 10 goats of different age groups (under 6 months and adults) were examined in all decades, months, and seasons of the year. *Bovicola* and other ectoparasites collected from various livestock farms were identified and analyzed.

As a result, the seasonal distribution and parasitic activity dynamics of *Bovicola*, including the emergence periods of their developmental stages (egg, larva, and imago), and the degrees of infestation (extensiveness and intensity) were determined in different decades, months, and seasons, across various geographical zones, farms, goat breeds, ages, and sexes. It was found that the infestation level was **maximal** during **December–May (62.0–99.0%)**, **minimal** during **June–September (15.5–21.0%)**, and **moderate** during **October–November (30.0–42.2%)** (Figure 1).



**Figure 1. Dynamics of Goat Infestation with *Bovicola caprae* by months**

The intensity of goat infestation with *Bovicola caprae* was studied on four main skin areas (the base of the horns, the back, the chest, and the base of the tail) within several square centimeters, i.e., in an area of  $10 \times 10 = 100 \text{ cm}^2$ . The following indicators were determined during the seasons:

1. **Winter months** – up to 1000 specimens, i.e., high intensity (HI);
2. **Spring months** – more than 1000 specimens, i.e., very high intensity (VHI);
3. **Summer months** – up to 10 specimens, i.e., low intensity (LI);
4. **Autumn months** – up to 100 specimens, i.e., moderate intensity (MI).

To determine the number of *Bovicola* collected from goats, the lice were placed on white filter paper inside a Petri dish greased with Vaseline oil, and their number was counted. To identify the species, the lice were kept in the Petri dish for 24 hours and examined using identification keys under MBS-1 and BMS-10 microscopes.

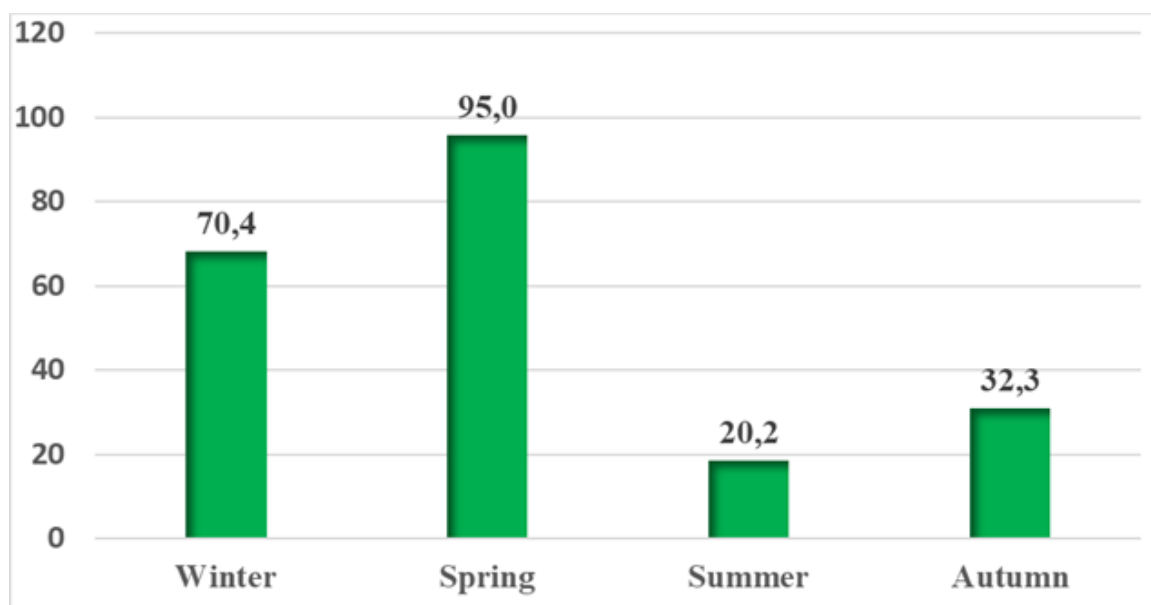
Using the stationary method in the three above-mentioned livestock farms, the seasonal extensive infestation (EI) of goats by lice was studied. In kids up to 5–6 months old and adult goats: Winter months – EI 67.5–68.7%, intensive infestation (II) 312–401 specimens per 100  $\text{cm}^2$ ; Spring months – EI 95.2–96.2%, II 814–972 specimens per 100  $\text{cm}^2$ ; Summer months – EI 16.3–20.5%, II 7–9 specimens per 100  $\text{cm}^2$ ; Autumn months – EI 27.8–34.3%, II 44–49 specimens per 100  $\text{cm}^2$ .

**Table 2. Seasonal Degree of Infestation of Goats of Different Ages with *B. caprae***

N.o	Age of goats	Phases of <i>B. caprae</i>	Extensive Infestation (EI) by Seasons, %			
			Winter	Spring	Summer	Autumn
1.	Up to 6 months	Egg	72,0	98,0	22,0	36,0
		Larva	70,0	94,0	18,0	32,0
		Imago: Male	65,0	96,0	20,0	34,0
		Imago: Female	68,0	97,0	22,0	35,0
		Total	68,7	96,2	20,5	34,3
2.	Older	Egg	70,0	96,0	18,0	30,0
		Larva	68,0	93,0	16,0	28,0
		Imago: Male	66,0	98,0	15,0	26,0
		Imago:	66,0	94,0	16,0	27,0

		Female				
		Total	67,5	95,2	16,3	27,8
		Total:	68,1	95,7	18,4	31,0

Using the route inspection method, the seasonal **extensive infestation (EI)** of goats by lice was studied in: “Chavandoz” farm – 80 goats, “Khudoyqulov F.I.” farm – 65 goats, “Jamshid” farm – 82 goats, “Nurobod Karakul Breeding” farm – 230 goats, “Andijon Pedigree Goats” farm – 810 goats, “Pahtakor-Tamorqa-Xizmati 2022” farm – 92 goats, “Imo Money Chang” farm – 65 goats, “Inmarka Lyuks” farm – 72 goats, “Nurota Karakul Breeding” livestock farm – 2,000 goats. The average seasonal EI levels were: Winter – 70.4%, Spring – 95.0%, Summer – 20.2%, Autumn – 32.3%. By region: Samarkand region – 51.2% of 457 goats, Navoi region – 55.0% of 2,000 goats, Andijan region – 61.7% of 1,039 goats



**Figure 2. Seasonal Dynamics of Goat *Bovicola* Infestation**

Goat *Bovicola* is widespread worldwide, and the disease is most frequently observed in goats kept in livestock farms with poor veterinary-sanitary conditions. The highest extensive infestation (EI) levels were recorded in winter and spring, while lower levels were observed in summer and autumn. This is because, during winter and spring, the goats' coat is thick and dense, and in unsanitary, humid storage conditions, *Bovicola* multiplies rapidly.

With the warming of the days during summer, goats shed their coat, or the hair becomes sparse and short. While grazing in pastures, sunlight warming the goat's skin through the coat inhibits the development of *Bovicola* and leads to a sharp decline in their population. During this period, *Bovicola* migrate to shaded and protected body areas that are more favorable for them, such as the spaces between the jaws and the lower abdomen, where they continue their development.

Goats of all ages are affected by *bovicollis*, with the disease being more severe in young goats. The parasites primarily localize on the base of the horns and ears, around the tail root, on the chest, and on the inner sides of the thighs. In affected goats, hair loss occurs and the skin undergoes hyperkeratosis. Additionally, cases were observed in some goats where *bovicollis* occurred simultaneously with hematopinososis or with trichophytosis, indicating co-infection of multiple diseases in a single animal.

In goats affected by *bovicollis*, disruption of the hair coat, development of dermatitis, dermatosis and hyperkeratosis of the skin, reduced appetite, severe weight loss, and the epizootic occurrence of the disease were observed.

**Conclusion.** Based on the epizootiological analysis of our above-mentioned research, among

entomotic diseases in goats, *bovicollis* is the most widespread, occurring on the body of goats throughout the year and affecting goats of all ages. The disease is more prevalent in farms with poor sanitary conditions, during cool seasons, and in livestock farms with high humidity, affecting nearly 90–100% of goats. The extensive and intensive infestation levels of *Bovicola* are maximal in winter and spring (70.4–95.0%), moderate in autumn (32.3%), and minimal in summer (20.2%). Goats affected by *bovicollis* exhibit disruption of the hair coat, dermatitis, dermatosis, hyperkeratosis of the skin, severe weight loss, and the disease occurs in an epizootic form.

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