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Research Article

Presence of Caprine Arthritis Encephalitis in goats in Lezhë County, Albania

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Abstract – This study aimed to investigate the occurrence of caprine arthritis encephalitis (CAE) in goats, within a region in northwestern Albania, specifically in the villages surrounding the Lezhë County. CAE, caused by the caprine arthritis encephalitis virus, is a persistent viral infection in goats, characterized by chronic inflammatory disease, which leads to substantial economic repercussions. While CAE is non-zoonotic, the need for effective monitoring and control measures is critical, underscoring the importance of comprehensive screening across Albania's goat populations. The detection of CAEV infection in this study was performed through serological analysis, employing the Maedi-Visna/CAEV Ab ELISA assay, a method designed for the identification of CAEV-specific antibodies. A total of 78 goats, randomly selected from four different herds, underwent serological testing to evaluate the prevalence of CAEV infection. Notably, 38.46% of the goats tested positive for CAEV, in an overall between-herd prevalence of 25%. These findings, based on serological evidence, provide strong confirmation of the presence of CAEV within the Lezhë County.

Keywords – Caprine Arthritis Encephalitis, Goat, Albania, Seroprevalence.

I. INTRODUCTION

The Caprine Arthritis Encephalitis Virus (CAEV) is a member of small ruminant lentiviruses (SRLV), belonging to the Lentivirus genus of the Retroviridae family [1], similar to HIV in humans. This virus integrates its genome into the host's DNA, resulting in lifelong infection by creating new viral particles within host cells, predominantly macrophages. CAEV causes chronic inflammatory diseases in goats, manifesting as arthritis, pneumonia, mastitis, and weight loss in adults goats, and encephalitis in kids.

Transmission occurs primarily through colostrum and milk ingestion by kids from infected adults [2], with iatrogenic and close-contact lateral transmission [3] also playing a role. All goat breeds and ages are susceptible to CAEV, and once infected, they remain carriers for life. Even asymptomatic goats can spread the virus, increasing infection rates in naïve populations.

In kids, CAEV commonly causes acute interstitial pneumonia or leukoencephalomyelitis [4], while in adults, chronic polyarthritis and mastitis [5] are observed after a long incubation period. CAEV spreads via live goat trade and germplasm movement [6], with infected goats showing reduced milk production

by 10-15%. Though CAEV-infected milk does not differ significantly from uninfected milk [7], transmission can also occur through contaminated equipment and semen [8]. While CAEV affects production efficiency, it is not zoonotic and poses no risk to human health or food safety.

Several risk factors have contributed to the transmission of the disease, including demographic characteristics (herd size, age of animal, and replacement rates) and breeding managements systems (intensive versus semi-intensive or extensive management, as well as the management of newborn animals. [9], [10], [11], [12], [13]

This study focuses on screening for Caprine Athritis Encephalitis (CAE) across various regions of Albania, while scientific research on the disease's incidence is still limited [14], [15], [16] and this paper aims to provide new insights by identifying CAE in a specific region, exploring an understudied aspect of its distribution in the Albanian goat population.

II. MATERIALS AND METHOD

The caprine blood samples are collected in four randomly chosen goat flock in the villages Gajush (municipal unit: Shënkoll), Velë (municipal unit: Kolsh), Mabë (municipal unit: Dajç) and Kallmet (municipal unit: Kallmet) in Lezhë County, in northwest Albania, as part of the Northern Region.

Peripheral blood from the jugular vein of 78 randomly selected adult goats (age > 2 years) was collected by venipuncture into 10 ml plane test tubes. The blood samples were centrifuged at 3000 rpm for 5 minutes and the sera was kept at -20°C until the analysis.

The diagnosis of caprine arthritis-encephalitis virus (CAEV) infection was obtained through serological testing using IDEXX Maedi-Visna/CAEV p28 Ab ELISA test kit. This kit is an indirect ELISA based on the use of an immunogenic peptide of a transmembrane protein (TM, ENV gene) and of the recombinant p28 protein which enters into the composition of the viral capsid (GAG gene).

The appearance of anti-p28 antibodies can occur slightly later than that of the anti-viral envelop protein antibodies. The use of this very stable protein allows the serological detection of a very wide spectrum of serological variants. The cut-off point was calculated according to the kit's instruction manual. Samples with S/P (sample-to-positive ratio) % ≥ 120 were considered positive, those with S/P % ≤ 110 were considered negative and those with S/P % > 110 and < 120 were considered as suspect.

III. RESULTS

Serum samples from 78 animals collected from four randomly chosen goat flock in the Lezhë County were tested for the presence of specific antibodies against SRLV using the ELISA method. Of 78 tested animals, 30 were found positive, corresponding to an overall seroprevalence of 38.46 % (presented in Table 1). Seropositive animals were found in 1 out of 4 goat flocks included in the study, giving an overall between-herd prevalence of 25%. There is no previous official evidence of Caprine Arthritis Encephalitis (CAE) in goat populations in the Lezhë County, at least in recent decades.

Table 1. The serological results for CAE prevalence based on ELISA test results in 4 goat herds.

	Herd Size	No. of tested animals	No. of positive	Prevalence%
Herd 1	80	30	30	100
Herd 2	100	21	0	0.0
Herd 3	65	12	0	0.0
Herd 4	90	15	0	0.0
Total		78	30	38.46

The results of this study, indicating a seroprevalence of 38.46% for Caprine Arthritis Encephalitis (CAE) in goats in Lezha, similarly to those in other publications [14], [15, [16], underscore the presence of CAE in certain regions of Albania. The findings from these publications demonstrate the prevalence

rates in goats ranging from 33.5% [15] to 42.8 [16] in Korça County, and as high as 92% [14] in a herd sampled from Fushë-Kruja region.

IV. DISCUSSION

Prophylactic strategies for CAE include screening and culling infected animals, strict adherence to hygiene protocols, isolation of infected from healthy animals, and avoiding the use of milk or colostrum from infected goats in neonatal feeding. Routine herd screening for CAE is crucial to prevent virus transmission and to maintain herd health. Suspected CAE cases require timely veterinary intervention for accurate diagnosis and adequate oversight.

V. CONCLUSION

The serological survey outlined in this study confirms the presence of the Caprine Arthritis Encephalitis virus in goats in Lezhë County, with an overall seroprevalence of 38.46% and an overall between-herd prevalence of 25%.

This highlights the critical need for a comprehensive national control strategy for Caprine Arthritis Encephalitis (CAE) in goats, alongside essential interventions to reduce the negative impact of this disease on animal health and to minimize economic losses for farmers.

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