Prošireni apstrakt

DOI: 10.5937/SVS26006D

BOGINJE OVACA I KOZA - EPIZOOTIOLOŠKA SITUACIJA I KARAKTERISTIKE BOLESTI U SRBIJI I ZEMLJAMA REGIONA

Mihailo Debeljak[1], Nikola Vasković[1], Milanko Šekler[1], Dejan Vidanović[1], Bojana Tešović[1], Kazimir Matović[1], Milovan Stojanović[1], Zoran Debeljak[1]

[1]Veterinarski specijalistički institut "Kraljevo", Kraljevo, Republika Srbija

**e-mail* kontakt osobe: mdebeljak@vsikv.com

Kratak sadržaj

Boginje ovaca i koza su virusne bolesti koje izaziva virus ovčijih boginja (SPPV) i virus kozjih boginja (GTPV). Pripadaju rodu *Capripoxvirus* iz porodice Poxviridae, zajedno sa virusom kvrgave kože (LSDV) goveda (King i sar., 2011; Zewdie i sar., 2021). Epizootiološka situacija u regionu tokom prethodnih godina ukazuje na intenzivnu cirkulaciju virusa i značajan broj žarišta. Tokom 2025. godine bolest je registrovana u više zemalja regiona: Bugarska 191, Grčka 1.703, Rumunija 27, Turska 79 i Srbija 3 žarišta, dok u 2026. godini, zaključno sa 5. avgustom, beleži i prostorno širenje: Bugarska 8, Grčka 214, Rumunija 6, Severna Makedonija 40, Turska 21, Srbija 1, kao i 4 žarišta na Kosovu i Metohiji (World Organisation for Animal Health [WOAH], n.d.; European Commission, 2026). Ovakva rasprostranjenost bolesti u neposrednom i širem okruženju Republike Srbije ukazuje na kontinuiran rizik od prekograničnog širenja infekcije. Rano prepoznavanje kliničkih znakova, blagovremeno prijavljivanje sumnje, pojačan nadzor i dosledno sprovođenje biosigurnosnih mera od ključnog su značaja za sprečavanje unosa i daljeg širenja bolesti.

Na teritoriji opštine Raška tokom 2025. godine registrovana su tri žarišta boginja ovaca, a epizootiološka istraživanja ukazuju na njihovu međusobnu povezanost. Zahvaljujući blagovremeno postavljenoj sumnji, brzoj laboratorijskoj potvrdi i sprovođenju propisanih mera kontrole, bolest se nije proširila na stada u okruženju. U jednom od tri zaražena gazdinstva, koje je bilo definisano kao kontaktno, bolest je registrovana 28 dana nakon poslednjeg potvrđenog slučaja u neposrednom susedstvu. Ovako dug vremenski interval između epizootiološki povezanih slučajeva ukazuje na mogući značaj indirektnog prenošenja i mogućnost opstanka infektivnog virusa u kontaminiranoj životnoj sredini, opremi, prevoznim sredstvima, odeći, obući ili drugom kontaminiranom materijalu. Vremenska i prostorna povezanost slučajeva u 2025. godini ukazuju na neophodnost da se prilikom epizootiološkog istraživanja, pored direktnih kontakata između životinja, posebna pažnja posveti mogućim indirektnim putevima širenja uzročnika. Nakon sanacije trećeg zaraženog gazdinstava sprovedena je preventivna depopulacija prijemčivih životinja u neposredno ugroženom području. Ovom merom bilo je obuhvaćeno šest stada sa

ukupno 63 ovce. Ukazujemo na potencijalni značaj preventivne depopulacije u epizootiološkim situacijama u kojima postoje jasni dokazi, ili sumnje, o širenju bolesti unutar prostorno i epizootiološki definisanog klastera.

Deset meseci nakon proglašenja područja opštine Raška slobodnim od boginja ovaca i koza, bolest je ponovo dijagnostikovana u avgustu 2026. godine na jednom gazdinstvu, na teritoriji iste opštine. Uprkos detaljnoj epizootiološkoj analizi kretanja životinja, ljudi, proizvoda i različitih roba, kontakata između gazdinstava i drugih relevantnih podataka, tačan put unosa virusa nije bilo moguće sa sigurnošću utvrditi. Definitivno, održavanje uzročnika u tom prostoru iz 2025. godine nije bilo moguće, tako da je nedvosmislen novi unos uzorčnika bolesti u ovoj godini.

Na osnovu prostornih i epizootioloških karakteristika pojave bolesti, kretanja ljudi i životinja, načina držanja i prometa malih preživara, kao i specifičnosti života stanovništva na ovom pograničnom području, kao jedna od epizootioloških hipoteza razmatrana je mogućnost unosa uzročnika sa, ili preko, teritorije Kosova i Metohije. Međutim, i pored utvrđenih brojnih potencijalnih mogućnosti, egzaktni epizootiološki podaci nisu omogućili nedvosmislenu potvrdu puta unosa infekta. Ova okolnost ističe složenost epizootioloških istraživanja u pograničnim područjima, posebno u uslovima u kojima postoji intenzivno kretanje ljudi i životinja, različiti oblici formalnog i neformalnog prometa i epizootiološki rizik od prisustva bolesti u okruženju.

U diferencijalnoj dijagnostici boginja ovaca i koza potrebno je uzeti u obzir više oboljenja malih preživara sa sličnom kliničkom slikom. Poseban značaj imaju kuga malih preživara, bolest plavog jezika, slinavka i šap, zarazni ektim, kontagiozna pleuropneumonija koza, pastereloza, kao i druga oboljenja koja mogu biti praćena febrilnošću, respiratornim poremećajima, promenama na sluzokožama ili kožnim lezijama. Dodatnu složenost epizootiološke situacije predstavlja činjenica da je tokom prethodne sezone na istom području bila prisutna bolest plavog jezika, čija se ponovna pojava može očekivati i tokom tekuće sezone. Takođe, poseban značaj ima činjenica da je na ovom području zarazna ektima ovaca enzootski prisutna bolest. Klinički pregled ima izuzetan značaj u postavljanju sumnje, ali zbog mogućnosti preklapanja kliničkih manifestacija konačna dijagnoza mora biti zasnovana na odgovarajućim diferencijalno dijagnostičkim laboratorijskim ispitivanjima.

Pravilan izbor i blagovremeno uzimanje uzoraka ključni su za pouzdanu laboratorijsku dijagnostiku. Za direktno dokazivanje uzročnika najznačajniji su bioptati aktivnih kožnih lezija, a u febrilnoj i ranoj fazi infekcije krv sa EDTA, nazalni, bukalni i okularni brisevi. Od uginulih ili eutanaziranih životinja uzimaju se limfni čvorovi, pluća i tkiva sa patološkim promenama, dok se za serologiju koristi krvni serum. Sekvenciranje genoma pomaže u utvrđivanju porekla infekcije, ali ne i puteva unosa. Izolati iz Raške 2025. i 2026. pokazali su visoku sličnost sa virusima iz regiona.

Praćenje prostorne i vremenske distribucije bolesti, kao i svih epizootioloških aktivnosti koje se sprovode na terenu, korišćenjem savremenih digitalnih mogućnosti u vidu interaktivnih mapa značajno olakšava praćenje i analizu urađenog i planiranje daljih mera kontrole bolesti i danas predstavlja neophodnost u kvalitetnom epizootiološkom radu.

Prevencija i kontrola boginja ovaca i koza zahtevaju integrisan pristup koji obuhvata kontinuirano podizanje nivoa znanja i svesti stočara i veterinarskih radnika, rano prepoznavanje kliničkih znakova i blagovremeno prijavljivanje sumnje, kontrolu prometa i kretanja životinja, primenu karantinskih mera, sprečavanje nekontrolisanih kontakata između stada, dosledno sprovođenje biosigurnosnih mera, čišćenje i dezinfekciju objekata, opreme i transportnih sredstava, epizootiološki nadzor i dostupnu laboratorijsku dijagnostiku. Podrška nadležnih organa u kontroli prometa životinja i proizvoda, koji mogu biti od interesa u širenju bolesti je izuzetno bitna, ali često nepotpuna i neadekvatna. Poseban značaj ima sistematsko epizootiološko istraživanje na terenu u slučaju pojave bolesti jer se samo u toku njihovog kvalitetnog sprovođenja mogu ustanoviti sve epizootiološke karakteristike pojave bolesti, uključujući puteve unosa, dužinu trajanja i puteve potencijalnog širenja.

Vakcinacija predstavlja jednu od mogućih mera prevencije i kontrole, a odluka o njenoj primeni treba da bude zasnovana na proceni rizika, aktuelnoj epizootiološkoj situaciji i usvojenoj strategiji kontrole bolesti.

Iskustva stečena tokom pojave boginja ovaca i koza na području opštine Raška pokazuju da efikasna kontrola bolesti zavisi od ranog prepoznavanja sumnjivih slučajeva, brze laboratorijske potvrde, detaljnog epizootiološkog istraživanja i pravovremenog sprovođenja mera na zaraženim i kontaktnim gazdinstvima. Ponovna pojava bolesti nakon višemesečnog perioda bez registrovanih slučajeva dodatno ukazuje na potrebu održavanja visokog nivoa epizootiološke budnosti i nakon formalnog suzbijanja žarišta, naročito u pograničnim područjima i regionima u kojima postoji stalni rizik od ponovnog unosa uzročnika.

Ključne reči: boginje ovaca i koza, epizootiologija, epizootiološki nadzor, laboratorijska dijagnostika, biosigurnost

LITERATURA

1. Zewdie, G., Derese, G., Getachew, B., Belay, H., & Akalu, M. (2021). Review of sheep and goat pox disease: Current updates on epidemiology, diagnosis, prevention and control measures in Ethiopia. Animal Diseases, 1(1), 28. https://doi.org/10.1186/s44149-021-00028-2
2. King, A. M. Q., Adams, M. J., Carstens, E. B., & Lefkowitz, E. J. (Eds.). (2011). Virus taxonomy: Ninth report of the International Committee on Taxonomy of Viruses. Elsevier Academic Press.
3. https://www.woah.org/en/home/
4. European Commission. (2026). Animal Disease Information System (ADIS): Overview report notification, 01/01/2025–31/12/2025. European Commission.
5. European Commission. (2026, August 6). Animal Disease Information System (ADIS): Current year notification, 01/01/2026–05/08/2026. European Commission.

SHEEP AND GOAT POX – EPIZOOTIOLOGICAL SITUATION AND DISEASE CHARACTERISTICS IN SERBIA AND COUNTRIES OF THE REGION

Mihailo Debeljak[1], Nikola Vasković[1], Milanko Šekler[1], Dejan Vidanović[1], Bojana Tešović[1], Kazimir Matović[1], Milovan Stojanović[1], Zoran Debeljak[1]

[1]Veterinary Specialist Institute "Kraljevo", Kraljevo, Serbia

*Corresponding author's e-mail: mdebeljak@vsikv.com

Summary

Sheep and goat pox are viral diseases caused by sheep pox virus (SPPV) and goat pox virus (GTPV). They belong to the genus *Capripoxvirus* within the family Poxviridae, together with lumpy skin disease virus (LSDV) of cattle (King et al., 2011; Zewdie et al., 2021). The epizootiological situation in the region during recent years indicates intensive virus circulation and a considerable number of outbreaks. During 2025, the disease was reported in several countries in the region: Bulgaria – 191 outbreaks, Greece – 1,703, Romania – 27, Türkiye – 79, and Serbia – 3 outbreaks. In 2026, as of 5 August, further geographical spread was recorded: Bulgaria – 8 outbreaks, Greece – 214, Romania – 6, North Macedonia – 40, Türkiye – 21, Serbia – 1, as well as 4 outbreaks in Kosovo and Metohija (World Organisation for Animal Health [WOAH], n.d.; European Commission, 2026). Such widespread occurrence of the disease in the immediate and wider surroundings of the Republic of Serbia indicates a continuous risk of transboundary spread of infection. Early recognition of clinical signs, prompt reporting of suspected cases, enhanced surveillance, and consistent implementation of biosecurity measures are essential for preventing disease introduction and further spread.

In the municipality of Raška, three sheep pox outbreaks were recorded during 2025, and epizootiological investigations indicated that they were epidemiologically linked. Owing to the timely suspicion of disease, rapid laboratory confirmation, and implementation of prescribed control measures, the infection did not spread to surrounding flocks. In one of the three infected holdings, which had previously been defined as a contact holding, the disease was detected 28 days after the last confirmed case in the immediate vicinity. Such a long interval between epidemiologically linked cases indicates the potential importance of indirect transmission and the ability of infectious virus to persist in a contaminated environment, equipment, vehicles, clothing, footwear, or other contaminated materials. The temporal and spatial association of cases in 2025 highlights the need for epizootiological investigations to consider not only direct animal-to-animal contact but also possible indirect routes of transmission. Following sanitation of the third infected holding, preventive depopulation of susceptible animals was carried out in the immediately endangered area. This measure included six flocks comprising a total of 63 sheep. These findings indicate the potential importance of preventive depopulation in epizootiological situations where there is clear evidence, or a strong suspicion, of disease spread within a spatially and epidemiologically defined cluster.

Ten months after the municipality of Raška had been declared free from sheep and goat pox, the disease was again diagnosed in August 2026 on one holding within the same municipality. Despite a detailed epizootiological analysis of animal and human movements, movements of products and various goods, contacts between holdings, and other relevant information, the exact route of virus introduction could not be established with certainty. Persistence of the causative agent in the area from the 2025 outbreaks was considered highly unlikely, indicating that the 2026 outbreak represented a new introduction of the virus.

Based on the spatial and epizootiological characteristics of disease occurrence, movements of people and animals, husbandry and trade practices involving small ruminants, as well as specific features of life in this border area, one of the epizootiological hypotheses considered was the possible introduction of the causative agent from, or via, the territory of Kosovo and Metohija. However, despite the identification of numerous potential opportunities for introduction, the available epizootiological data did not allow unequivocal confirmation of the route by which the infectious agent entered the area. This circumstance highlights the complexity of epizootiological investigations in border regions, particularly under conditions characterised by intensive movement of people and animals, various forms of formal and informal trade, and an ongoing epizootiological risk associated with the presence of disease in surrounding areas.

The differential diagnosis of sheep and goat pox should include several diseases of small ruminants that may present with a similar clinical picture. Of particular importance are peste des petits ruminants, bluetongue, foot-and-mouth disease, contagious ecthyma, contagious caprine pleuropneumonia, pasteurellosis, and other diseases that may be accompanied by fever, respiratory disorders, mucosal lesions, or skin lesions. An additional challenge to the epizootiological situation is the fact that bluetongue was present in the same area during the previous season and may recur during the current season. Furthermore, contagious ecthyma is enzootically present in sheep in this area. Clinical examination is of major importance in raising suspicion of disease; however, because clinical manifestations may overlap, the final diagnosis must be based on appropriate differential diagnostic laboratory testing.

Appropriate selection and timely collection of samples are essential for reliable laboratory diagnosis. For direct detection of the causative agent, biopsies of active skin lesions are the most valuable samples, while EDTA blood, nasal, buccal, and ocular swabs are useful during the febrile and early stages of infection. In dead or euthanised animals, lymph nodes, lungs, and tissues showing pathological lesions may be collected, whereas serum is used for serological testing. Genome sequencing can assist in determining the origin of infection, but it cannot by itself establish the route of virus introduction. Isolates obtained in Raška in 2025 and 2026 showed a high degree of similarity to viruses circulating in the region.

Monitoring the spatial and temporal distribution of the disease, as well as all epizootiological activities conducted in the field, through modern digital tools such as interactive maps considerably facilitates the monitoring and analysis of completed activities and the planning of further disease-control measures. Today, such tools represent an important component of high-quality epizootiological work.

Prevention and control of sheep and goat pox require an integrated approach that includes continuous improvement of the knowledge and awareness of livestock owners and veterinary professionals, early recognition of clinical signs and prompt reporting of suspected cases, control of animal trade and movements, implementation of quarantine measures, prevention of uncontrolled contact between flocks, consistent application of biosecurity measures, cleaning and disinfection of premises, equipment, and transport vehicles, epizootiological surveillance, and access to laboratory diagnostics. Support from the competent authorities in controlling the movement and trade of animals and products that may contribute to disease spread is extremely important, but is often incomplete or inadequate. Systematic field-based epizootiological investigation is particularly important following the occurrence of disease, since only through high-quality investigations can the full epizootiological characteristics of an outbreak be determined, including possible routes of introduction, duration of infection, and potential pathways of further spread.

Vaccination represents one of the possible measures for prevention and control, and the decision to implement vaccination should be based on risk assessment, the current epizootiological situation, and the adopted disease-control strategy.

Experience gained during the occurrence of sheep and goat pox in the municipality of Raška demonstrates that effective disease control depends on early recognition of suspected cases, rapid laboratory confirmation, detailed epizootiological investigation, and timely implementation of measures on infected and contact holdings. The re-emergence of the disease after several months without registered cases further highlights the need to maintain a high level of epizootiological vigilance even after outbreaks have formally been brought under control, particularly in border areas and regions where there is a continuous risk of reintroduction of the causative agent.

Keywords: sheep and goat pox, epizootiology, epizootiological surveillance, laboratory diagnostics, biosecurity

REFERENCES

1. Zewdie, G., Derese, G., Getachew, B., Belay, H., & Akalu, M. (2021). Review of sheep and goat pox disease: Current updates on epidemiology, diagnosis, prevention and control measures in Ethiopia. Animal Diseases, 1(1), 28. https://doi.org/10.1186/s44149-021-00028-2
2. King, A. M. Q., Adams, M. J., Carstens, E. B., & Lefkowitz, E. J. (Eds.). (2011). Virus taxonomy: Ninth report of the International Committee on Taxonomy of Viruses. Elsevier Academic Press.
3. https://www.woah.org/en/home/
4. European Commission. (2026). Animal Disease Information System (ADIS): Overview report notification, 01/01/2025–31/12/2025. European Commission.
5. European Commission. (2026, August 6). Animal Disease Information System (ADIS): Current year notification, 01/01/2026–05/08/2026. European Commission.