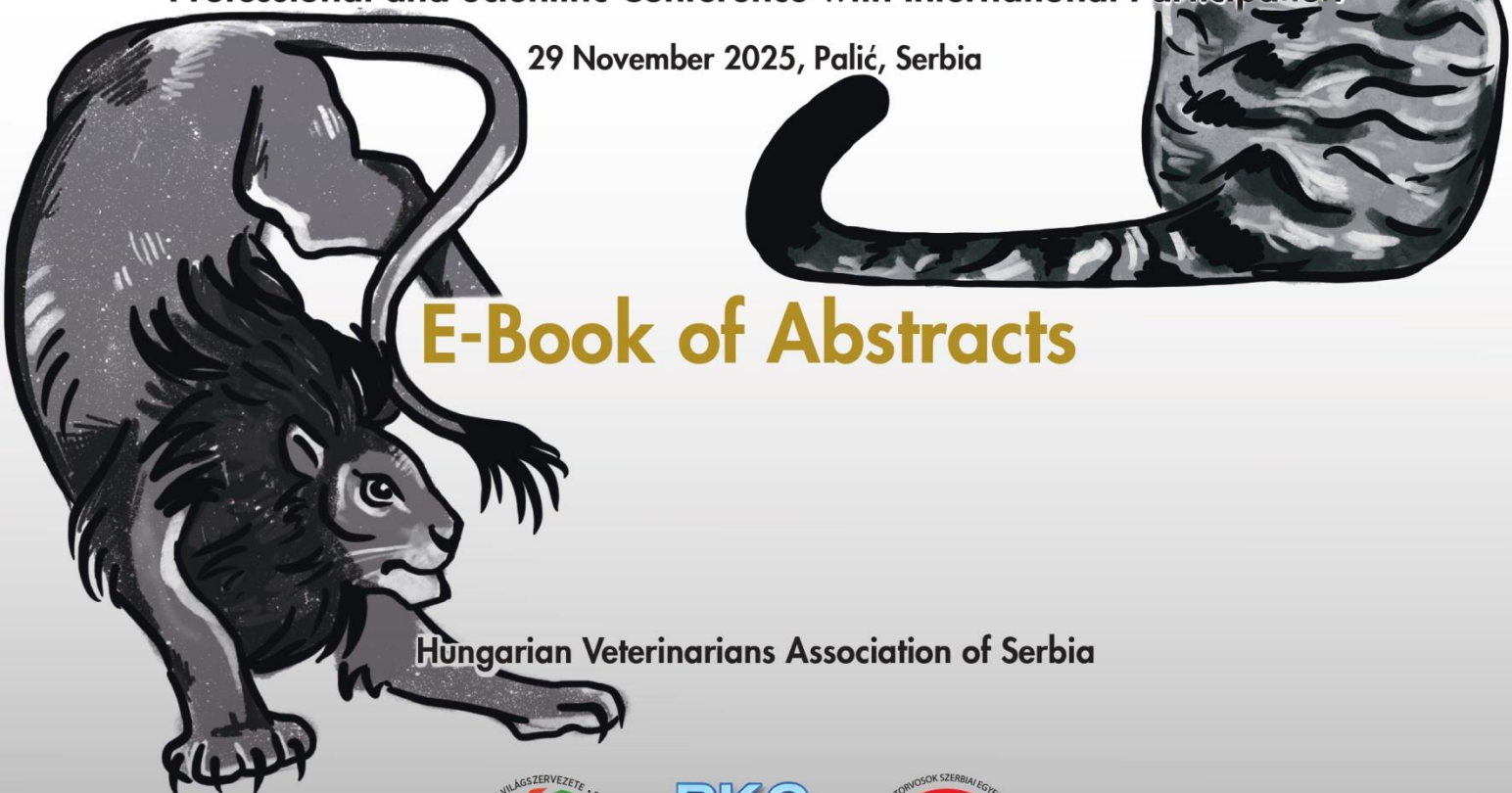




4th ŠINKOVIĆ MEMORIAL DAY

Professional and Scientific Conference with International Participation

29 November 2025, Palić, Serbia



E-Book of Abstracts

Hungarian Veterinarians Association of Serbia



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Professional and Scientific Conference with International Participation

E-Book of Abstracts

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PREFACE

For the fourth consecutive year, the Hungarian Veterinarians Association of Serbia organized the 4th “Šinković” Memorial Day – a Professional and Scientific Conference with International Participation – held in memory of Assistant Professor Dr. Mirko Šinković, PhD.

The 4th “Šinković” Memorial Day was held on November 29, 2025, at the Palić Zoo. The main topic of this year’s conference was exotic and wild animals; however, the scientific programme also encompassed a wide range of topics from various fields of veterinary medicine, reflecting the breadth and diversity of the profession.

This electronic Book of Abstracts contains summaries of invited lectures as well as contributions presented in the poster section, including student papers, all of which were presented at the conference.

In addition to its scientific objectives, the conference aims to promote the enduring professional and ethical values advocated and embodied by Assistant Professor Dr. Mirko Šinković throughout his life and work. These values include open and supportive communication, professional networking and cooperation at both national and international levels, continuous professional development, conscientious and responsible work, as well as commitment and determination in addressing challenges in a timely and appropriate manner.

We hope that this E-Book of Abstracts will serve not only as a record of the conference, but also as a meaningful contribution to the continued exchange of knowledge and the strengthening of professional ties within the veterinary community.

Scientific and Organizing Committee

SCIENTIFIC PROGRAM

4th “Šinković” Memorial Day Professional and Scientific Conference with International Participation in Honor and Memory of Assist. Prof. Dr. Mirko Šinković

Date and Time: November 29, 2025 (Saturday), starting at 10:00 a.m.

Venue: Palić Zoo (Krfška St. 4, 24413 Palić, Serbia)

9:00 - 10:00	Registration of Participants
10:00 - 10:20	Opening of the Professional and Scientific Conference – Welcome Addresses
10:20 - 11:00	Prof. Dr. Dušan Lalošević, PhD – <i>Faculty of Medicine, Department of Histology and Embryology, Novi Sad (Republic of Serbia)</i> Interesting Cases in Pathological Diagnosis of Infectious and Neoplastic Diseases in Animal
11:00 - 11:40	Prof. Dr. János Gál, Dipl. ECZM, PhD – <i>University of Veterinary Medicine, Head of the Department of Exotic Animal-, Wildlife-, Fish- and Honeybee Medicine, Budapest (Hungary)</i> Animal health experiences with captive breeding of the European brown hare (<i>Lepus europaeus</i>)
11:40 - 12:20	Assoc. Prof. Dr. Maja Lukač, Dipl. ECZM, PhD – <i>University of Zagreb, Faculty of Veterinary Medicine, Department and Clinic of Poultry Health, Zagreb (Republic of Croatia)</i> Selected Diseases of Reptiles
12:20 - 12:50	COFFEE BREAK and POSTER PRESENTATIONS
12:50 - 13:30	Prof. Dr. Miloš Vučičević, PhD – <i>University of Belgrade, Faculty of Veterinary Medicine, Department of Equine, Carnivore, Poultry, and Wildlife Health, Belgrade (Republic of Serbia)</i> African Pygmy Hedgehog in Veterinary Practice: Biological Characteristics, Clinical Examination, and Common Diseases
13:30 - 14:10	Prof. Dr. Jožko Račnik, Dipl. ECZM, PhD – <i>University of Ljubljana, Faculty of Veterinary Medicine, Clinic for Birds, Small Mammals, and Reptiles, Ljubljana (Republic of Slovenia)</i> Abdominal Surgery in Pet Rabbits – Selected Clinical Cases
14:10 - 14:50	Assist. Prof. Dr. Sándor Sikó-Barabási, PhD – <i>Sapientia Hungarian University of Transylvania, Sfântu Gheorghe (Transylvania, Romania)</i> Myths and Realities about the Carpathian Brown Bear Based on Personal Experience
14:50 - 15:30	Prof. Dr. Amina Hrković, PhD & Prof. Dr. Lejla Velić, PhD – <i>University of Sarajevo, Faculty of Veterinary Medicine, Department of Basic Veterinary Sciences & Department of Pathobiology and Epidemiology, Sarajevo (Bosnia and Herzegovina)</i> The Role of Rodents in the Occurrence and Spread of Leptospirosis in Urban Areas
15:40 - 16:00	Wreath-Laying at the Memorial Plaque
16:00 -	Cocktail Lunch for the Participants of the Conference

4th “ŠINKOVIĆ” MEMORIAL DAY

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4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Interesting Cases in Pathological Diagnosis of Infectious and Neoplastic Diseases in Animal

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General pathology and pathohistological diagnostics represent the basis of both human and veterinary medicine. Like microbiology, general pathology is proof of one medicine for all vertebrates, and especially for mammalian species, including humans. The development of pathology as a discipline is mostly related to the faculties of veterinary medicine, and to a lesser extent to specialist veterinary institutes. The first department of general pathology at the Faculty of Veterinary Medicine in Vienna was founded by Jovan Čokor (Johann Csokor), and his assistant Antonije Vuković founded the Department of Pathology at the Faculty of Veterinary Medicine in Belgrade in 1936. Veterinarians in Serbia have been required to perform autopsies on animals since the end of the 19th century. Before the discovery of Negri's bodies (1903), veterinarians had to perform an autopsy on a dog suspected of rabies and confirm the suspicion only on the basis of macroscopic findings. Autopsy was prohibited only in case of suspicion of anthrax. Today, surgical or biopsy pathology, or pathohistological diagnosis of samples surgically removed from domestic animals, has become very important in veterinary practice.

In our practice started at the Pasteur Institute and at the Department of Veterinary Medicine of the Faculty of Agriculture in Novi Sad, in addition to student exercises in autopsy and pathological-histological diagnostics, biopsy diagnostics is also common, especially in small practices. We provide an overview of the pathological entities found, which include tumors and some infectious diseases of animals, both pets, farm animals and animals from the Palić Zoo. In addition to rabies, pathological histology is included in the diagnosis of tuberculosis, Marek's disease, infectious pulmonary adenomatosis and infectious nasal adenocarcinoma of sheep, a recently proven entity in Serbia. Among the parasitic zoonoses where the pathology was key for diagnosis in our country, toxocariasis, pulmonary capillariasis and multilocular echinococcosis are particularly interesting, newly registered zoonoses since 2016 in Serbia in foxes and jackals, with the first human cases discovered in 2022.

Classic animal tumor pathology is used for the diagnosis of skin benign and malignant tumors, including mammary tumors, but also tumors of internal organs. In the analysis of our surgical material from a small veterinary practice, the majority were operations on dogs, of which 64% were benign skin tumors, the most common being sebaceous adenoma in 15% of cases. Malignant tumors of the skin were 20%, the most common was mast cell tumors in 5% of cases. About 10% of all cases were equally benign and malignant mammary tumors. A total of 15% of surgical material with tumors of internal organs was received, of which the most common were hemangiomas and hemangiosarcomas of the spleen in 3.7% of all cases. The most interesting cases that present both surgical and pathohistological challenges occur in less than 1% of cases, for example, malignant melanoma of the skin and oral cavity, hyperplasia and adenocarcinoma of the prostate, carcinosarcoma of the bladder, adenoma and colon cancer. In this way, surgical pathology has become a useful service in veterinary medicine, with which pet owners are also satisfied.

Keywords: animals, pathology, infections, tumors, diagnostics

4th "ŠINKOVIĆ" MEMORIAL DAY INVITED LECTURES

Zanimljivi slučajevi patološke dijagnostike infekcijskih i neoplastičnih bolesti životinja

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Opšta patologija i patohistološka dijagnostika predstavljaju osnov kako humane, tako i veterinarske medicine. Kao i mikrobiologija, tako je i opšta patologija dokaz jedne medicine za sve kičmenjake a naročito za sisarske vrste uključiv i čoveka. Razvoj patologije kao discipline najviše je vezan za fakultete veterinarske medicine, a manjim delom i za specijalističke veterinarske institute. Prvu katedru opšte patologije na Veterinarskom fakultetu u Beču osnovao je Jovan Čokor (Johann Csokor) a njegov asistent Antonije Vuković osnovao je Katedru patologije na Veterinarskom fakultetu u Beogradu 1936. godine. Obdukcije životinja bili su u obavezi da rade veterinari u Srbiji još od kraja 19. veka. Pre otkrića Negrijevih tela (1903) veterinari su morali da urade obdukciju psa sumnjivog na besnilo i samo na osnovu makroskopskog nalaza potvrde sumnju. Jedino je kod sumnje na antraks obdukcija bila zabranjena. Danas je u veterinarskoj praksi postala jako značajna i hirurška ili biopsijska patologija, odnosno patohistološka dijagnostika promena hirurški uklonjenih sa domaćih životinja.

U našoj praksi započetoj u Pasterovom zavodu i na Departmanu za veterinarsku medicinu Poljoprivrednog fakulteta u Novom Sadu pored vežbi iz obdukcione i patološko-histološke dijagnostike, uobičajena je i biopsijska dijagnostika naročito u maloj praksi. Dajemo prikaz nađenih patoloških entiteta koji obuhvataju tumorske i neke infektivne bolesti životinja, kako kućnih ljubimaca, tako i farmskih i životinja iz Zoo-vrta Palić. Pored besnila, patološka histologija je uključena u dijagnostiku tuberkuloze, Marekove bolesti, infektivne plućne adenomatoze i infektivnog nazalnog adenokarcinoma ovaca, nedavno dokazanog entiteta u Srbiji. Među parazitskim zoonozama gde je patologija bila ključna za dijagnostiku kod nas posebno su interesantne toksokarijaza, plućna kapilarijaza i multilokularna ehinokokoza, novoregistrovana zoonoza od 2016. godine u Srbiji kod lisica i šakala, a sa prvim humanim slučajevima otkrivenim 2022. godine.

Klasična tumorska patologija životinja koristi se za dijagnostiku kožnih benignih i malignih tumora uključujući i mamarne tumore, ali i tumora unutrašnjih organa. U analizi našeg hirurškog materijala iz veterinarske male prakse, najviše je bilo operacija pasa, od toga benignih kožnih tumora bilo je 64%, najčešći je sebacealni adenom u 15% slučajeva. Malignih tumora kože bilo je 20%, najčešći je bio mastocitom u 5% slučajeva. Oko 10% od svih slučajeva bilo je podjednako benignih i malignih marnih tumora. Ukupno je operativnog materijala tumora unutrašnjih organa primljeno 15%, od toga najčešći su bili hemangiomi i hemangisarkomi slezine u 3,7% svih slučajeva hirurške patologije. Najinteresantniji slučajevi koji predstavljaju kako hirurški tako i patohistološki izazov, javljaju se u manje od 1% slučajeva, na primer maligni melanom kože i usne duplje, hiperplazija i adenokarcinom prostate, karcinosarkom mokraćne bešike, adenom i karcinom debelog creva. Na taj način hirurška patologija postala je korisna usluga u veterinarskoj medicini, sa kojom su zadovoljni i vlasnici kućnih ljubimaca.

Ključne reči: životinje, patologija, infekcije, tumori, dijagnostika

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Animal health experiences with captive breeding of the European brown hare (*Lepus europaeus*)

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The European brown hare (*Lepus europaeus*) is one of the most important game species in lowland habitats. Very little published data is available on its captive rearing and breeding. Successful breeding experiments have been conducted primarily in Italy and France. The Department of Exotic Animal, Wildlife, Fish and Honeybee Medicine and its head have been conducting research for more than a decade on the breeding of brown hares in closed spaces, the development of the technology involved, and animal health issues.

The results of our research to date show that the highest mortality rate, as high as 45-55%, occurs mainly during birth and weaning periods, which may be due to several non-infectious and infectious diseases.

The most common infectious disease causing loss in the first two weeks of life, when the young are mainly fed with milk, is acute enteritis caused by *Clostridium perfringens*. In this case, farm-specific vaccination of the breeding stock can provide effective protection.

A common cause of death in the first few days of life is internal organ damage due to mechanical trauma, as well as starvation. Coccidiosis can cause significant losses in young rabbits. Diagnosing this disease can sometimes be very challenging, as infected rabbits often die in the early stages before oocysts can be detected in the intestinal contents. Preventive treatment and grid flooring can help prevent the disease.

At any age, hares are very sensitive to poor-quality feed, which can cause losses of up to 70-80%. Feed contaminated with fungal toxins or peroxides in particular causes stomach ulcers, liver and kidney degeneration, and acute enteritis.

In autumn and winter, serious mortality can result from various facultative pathogenic bacteria living in the upper respiratory tract (*Bordetella bronchiseptica*, *Pasteurella multocida*) can cause serious mortality. Mixed infections are common, with catarrhal rhinitis, conjunctivitis, and necrotic-croupous pneumonia being the typical pathological changes. This syndrome can be effectively prevented with a farm-specific vaccination program.

The keeping and breeding of brown hares in captivity can be achieved with well-developed husbandry and feeding techniques, great attention and care, and the implementation of appropriate animal health prevention programs.

Keywords: *Lepus europaeus*, captive breeding, mortality, infectious diseases, prevention

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

A mezei nyúl (*Lepus europaeus*) zárttéri tenyésztés állategészségügyi tapasztalatai

Gál János

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A mezei nyúl (*Lepus europaeus*) a síkvidéki, alföldi élőhelyek egyik legfontosabb vadfaja. A zárttéri tartásával és tenyésztésével kapcsolatosan igen kevés publikált adat áll a rendelkezésünkre. A tenyésztésével elsősorban Olaszországban és Franciaországban vannak sikeres kísérletek. Az Egzotikusállat-, Vad-, Hal- és Méhegészségügyi Tanszék és vezetője már több mint egy évtizede folytat vizsgálatokat a mezei nyúl zárttéri tenyésztésével, annak technológiai kidolgozásával és állategészségügyi kérdéseinek a vizsgálatával kapcsolatosan.

Az eddigi kutatásaink eredményeiből kitűnik, hogy a legnagyobb mortalitási ráta, akár 45-55 % is, főleg a megszületési és a választási időszakokra esik, aminek hátterében számos fertőző- és nem fertőző betegség állhat.

A leggyakoribb veszteséget okozó fertőző betegség a kölykök első két élethetében, amíg főleg tejjel táplálkoznak, a *Clostridium perfringens* okozta acut enteritis. Ebben az esetben a törzsállomány telepspecifikus vakcinázása nyújthat hathatós védelmet.

Az élet első pár napjában gyakori elhullási ok a mechanikai trauma miatti belső szervi károsodás, az eléhezés is. A növedék korban jelentős veszteséget okozhat a kokcidiosis. Ennek diagnosztikája néha nagy kihívást jelent, mert a fertőzött nyúl már a korai szakban gyakran elhullik, mielőtt az oocysta kimutatható lenne a béltartalomról. A megbetegedés megelőzésére a preventív kezelés és a rácspadlós tartás jelenthet megoldást.

Bármely életkorban nagyon érzékeny a mezei nyúl a nem megfelelő minőségű táplálékra, ami akár 70-80% körüli veszteségeket is okozhat. Különösen a gombatoxinokkal szennyezett vagy peroxidokkal terhelt takarmány vált ki gyomorfekélyt, máj- és vese elfajulást, acut enteritist. Az őszi, téli időszakban komoly elhullás származhat a különféle, légutakban élő, fakultatív patogén baktériumok (*Bordetella bronchiseptica*, *Pasteurella multocida*) okozta felső légúti- és a tüdőt érintő gyulladásos folyamatokból. Itt gyakori a kevert fertőződés, amikor hurutos rhinitis, kötőhártya gyulladás, elhalásos-kruppos jellegű pneumonia a jellemző kórtani elváltozások. Ez a kórkép jól megelőzhető telepspecifikus vakcinázási programmal.

A mezei nyúl fogságban történő tartása és tenyésztése jól kidolgozott tartási és etetési technológiával, nagy odafigyeléssel és gondossággal, továbbá megfelelő állategészségügyi prevenciós programok megvalósításával megoldható.

Kulcsszavak: *Lepus europaeus*, zárttéri tenyésztés, mortalitás, fertőző betegségek, prevenció

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Selected Diseases of Reptiles

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Reptiles represent a group of animals with more than 11,000 known species that differ in size, morphology, and ecology. Due to their attractiveness and accessibility, many species are now kept in captivity for educational, research, or private purposes. However, successful husbandry requires precise knowledge of each species' physiology and specific needs. As ectothermic animals dependent on external heat sources, reptiles in captivity often become ill when the conditions in their enclosures are not optimal. The most common diseases result from inappropriate microclimatic conditions, inadequate nutrition, and failures in quarantine or preventive procedures.

Secondary nutritional hyperparathyroidism is one of the most common noninfectious diseases in captive reptiles. This disorder occurs due to a lack of adequate UVB light needed for vitamin D₃ synthesis and insufficient calcium in the diet. In such cases, calcium is mobilized from the bones and the shells of turtles, leading to softening, deformities, and pathological fractures. In severe cases, kidney failure, anemia, respiratory distress, and numerous related problems may develop. Diagnosis is based on history, clinical and radiological findings, and blood tests. Treatment includes correcting the husbandry conditions, supplementing calcium and vitamin D₃, and administering calcitriol or calcitonin depending on the condition of the internal organs, along with supportive therapy.

Another common problem in female reptiles is **follicular stasis**, most often associated with stress, inadequate nutrition, lack of hibernation, or hormonal disorders. If resorption does not occur, the follicles can cause inflammation of the ovaries, oviducts, and coelomic cavity. Therapy includes improving husbandry conditions, allowing egg-laying, and, if necessary, surgical removal of the ovaries and oviducts (ovariosalpingectomy).

Dystocia, or retention of eggs or fetuses, can be obstructive or non-obstructive. Obstructive forms arise due to an anatomical blockage preventing egg-laying, while non-obstructive forms result from inadequate husbandry conditions, dehydration, obesity, or infections. Non-obstructive dystocia is treated with oxytocin and calcium along with supportive therapy, while obstructive dystocia usually requires surgical intervention.

Among infectious diseases, **mycoplasma infections** play an important role, especially in tortoises. Mycoplasmas cause inflammation of the upper respiratory tract, manifested by conjunctivitis, rhinitis, and swelling of the eyelids. If left untreated, secondary bacterial infections and pneumonia may develop. The disease is diagnosed by polymerase chain reaction (PCR), and treatment is supportive.

In snakes, **viral diseases** such as infections with reptarenavirus (the causative agent of inclusion body disease) and nidovirus are increasingly common. These viruses cause respiratory and neurological disorders. Both diseases have a long incubation period and often lead to high mortality rates in captive populations. Diagnosis is made using PCR analysis, and specific therapy is currently unavailable.

Prevention of reptile diseases is based on proper nutrition, maintenance of suitable microclimatic conditions, regular veterinary examinations, and quarantine procedures for each new individual.

Keywords: reptiles, noninfectious diseases, infectious diseases, ectotherms, quarantine

4th "ŠINKOVIĆ" MEMORIAL DAY INVITED LECTURES

Odabrane bolesti gmazova

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Gmazovi predstavljaju skupinu životinja s više od 11000 poznatih vrsta koje se razlikuju po veličini, morfologiji i načinu života. Zbog svoje atraktivnosti i dostupnosti, mnoge se vrste danas drže u zatočeništvu, bilo u edukativne, istraživačke ili privatne svrhe. Međutim, njihovo uspješno držanje zahtijeva precizno poznavanje fiziologije i specifičnih potreba svake vrste. Budući da su ektotermne životinje, ovisne o vanjskim izvorima topline, gmazovi u zatočeništvu često obolijevaju kada uvjeti u nastambama nisu optimalni. Najčešće bolesti rezultat su neprikladnih mikroklimatskih uvjeta, neadekvatne prehrane te propusta u karantenskim i preventivnim postupcima.

Sekundarni nutritivni hiperparatireoidizam predstavlja jednu od češćih nezaraznih bolesti gmazova u zatočeništvu. Ovaj poremećaj nastaje uslijed nedostatka adekvatne uvb svjetlosti potrebne za sintezu vitamina D₃ te nedostatka kalcija u prehrani. Pri navedenom stanju, kalcij se mobilizira iz kostiju i oklopa kornjača, što dovodi do omekšanja, deformacija i patoloških prijeloma. U težim slučajevima razvijaju se oštećenja bubrega, anemija, otežano disanje i brojni povezani problemi. Dijagnoza se postavlja na temelju anamneze, kliničkih i radioloških nalaza te krvne slike. Liječenje uključuje korekciju uvjeta držanja, nadoknadu kalcija i vitamina D₃, aplikaciju kalcitriola ili kalcitonina, ovisno o stanju unutarnjih organa, te potpurnu terapiju.

Drugi čest problem u ženki gmazova je zastoj folikula, najčešće povezan sa stresom, neadekvatnom prehranom, izostankom hibernacije ili hormonalnim poremećajima. Ako ne dođe do resorpcije, folikuli mogu uzrokovati upalu jajnika, jajovoda i celoma. Terapija uključuje poboljšanje uvjeta držanja, omogućavanje polaganja jaja, i, po potrebi, kirurško uklanjanje jajnika i jajovoda (ovariosalpingektomija).

Distocija, odnosno zadržavanje jaja ili fetusa, može biti opstruktivska ili neopstruktivska. Opstruktivski oblici nastaju zbog anatomske zapreke u polaganju jaja, dok neopstruktivski proizlaze iz neadekvatnih uvjeta držanja, dehidracije, pretilosti ili infekcija. Kod neopstruktivske distocije primjenjuju se oksitocin i kalcij uz potpurnu terapiju, dok se opstruktivska distocija najčešće liječi kirurški.

Od zaraznih bolesti, važnu ulogu imaju mikoplazmatske infekcije, osobito u kopnenih kornjača. Mikoplazme u gmazova uzrokuju upale gornjih dišnih putova koje se očituju konjunktivitisom, rinitisom i otečenjem kapaka. U neliječenim slučajevima može doći do sekundarnih bakterijskih infekcija i pneumonije. Bolest se dijagnosticira lančanom reakcijom polimerazom (PCR), a terapija je potporna.

U zmija se sve češće javljaju virusne bolesti poput infekcija reptarenavirusom (uzročnik inkluzijske bolesti zmija) i nidovirusom, koje uzrokuju respiratorne i neurološke poremećaje. Obje bolesti imaju dug inkubacijski period i često dovode do visoke smrtnosti u uzgojima. Dijagnoza se postavlja PCR analizom, a specifična terapija zasad ne postoji.

Prevenција bolesti gmazova temelji se na pravilnoj prehrani, osiguravanju odgovarajućih mikroklimatskih uvjeta, redovitim veterinarskim pregledima i provođenju karantene kod svake nove jedinke.

Ključne riječi: gmazovi, nezarazne bolesti, zarazne bolesti, ektotermi, karantena

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

African Pygmy Hedgehog in Veterinary Practice: Biological Characteristics, Clinical Examination, and Common Diseases

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African pygmy hedgehogs are increasingly presented as patients in veterinary practice, both worldwide and in the Republic of Serbia. These animals possess a range of anatomical and physiological peculiarities, which makes the assessment of their health status particularly challenging and requires a specific approach. Understanding these species-specific characteristics is essential for interpreting pathology and correctly assessing the clinical picture. Recognition of disease by owners is further complicated by the fact that hedgehogs are able to conceal clinical signs for prolonged periods. As prey animals in their natural environment, they have developed mechanisms to mask illness in order to avoid predation. Consequently, clinical manifestations usually become evident only after compensatory mechanisms are exhausted. At that point, owners typically observe a sudden onset of clinical problems and seek veterinary care under the impression that the condition is acute, although the underlying disease is often chronic in nature. Under such circumstances, in addition to primary pathological changes, numerous secondary disturbances are frequently present, which further complicates the diagnostic process. To establish the etiology of disease, careful selection of samples and the use of specialized diagnostic methods are required, sometimes necessitating anesthesia. All procedures must be tailored to the species to ensure reliable and clinically relevant results. Once a diagnosis is achieved, the selection of an appropriate therapeutic protocol becomes crucial. Therefore, it is essential that veterinarians are well acquainted with the peculiarities of pathology, diagnostics, and therapy in African pygmy hedgehogs.

Keywords: African pygmy hedgehog, diseases, therapy, diagnostics, anesthesia

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Afrički patuljasti jež u veterinarskoj praksi: biološke karakteristike, klinički pregled i najčešća oboljenja

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Afrički patuljasti ježevi sve češće postaju pacijenti u veterinarskoj praksi, kako u svetu, tako i u R. Srbiji. Reč je o životinjama koje poseduju niz anatomskih i fizioloških specifičnosti, zbog čega ispitivanje njihovog zdravstvenog stanja zahteva poseban pristup i vrlo je izazovno. Poznavanje ovih osobenosti ključno je za razumevanje patologije i pravilno tumačenje kliničke slike. Prepoznavanje bolesti od strane držaoca dodatno je otežano činjenicom da ježevi dugo mogu prikrivati simptome. Kao životinje koje u prirodi pripadaju kategoriji plena, razvili su mehanizme kojima prikrivaju znake oboljenja, štiteći se tako od predatora. Zbog toga se klinički simptomi ispoljavaju tek kada dođe do iscrpljivanja svih kompenzatornih mehanizama. Držaoci tada obično primećuju naglu pojavu problema i obraćaju se veterinaru uvereni da se radi o akutnom stanju, iako je osnovna bolest često hroničnog karaktera. U takvim okolnostima, pored znakova primarne patologije, prisutni su i brojni simptomi sekundarnih poremećaja, što znatno otežava dijagnostiku. Da bi se otkrio uzrok oboljenja, neophodan je pažljiv izbor uzoraka i primena specijalističkih dijagnostičkih metoda, koje ponekad zahtevaju i upotrebu anestezije. Sve procedure moraju biti prilagođene vrsti kako bi rezultati bili pouzdani i klinički relevantni. Nakon postavljanja dijagnoze, od presudne je važnosti izbor adekvatnog terapijskog protokola. Stoga je nužno da veterinari budu dobro upoznati sa specifičnostima patologije, dijagnostike i terapije afričkih patuljastih ježeva.

Ključne reči: afrički patuljasti jež, bolesti, terapija, dijagnostika, anestezija

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Abdominal Surgery in Pet Rabbits – Selected Clinical Cases

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The basic principles of celiotomy in other species apply to rabbits. As in other animals, preoperative clinical examination with blood work and biochemistry testing is important. Radiography and other imaging are also useful in surgical planning. Rabbits cannot vomit, so fasting is usually not necessary, yet a short fast is recommended to allow the rabbit to swallow all the food from their mouth to reduce the risk of food entering the trachea during the intubation. Proper thermal support is provided for the rabbit before, during, and after surgery and is essential for a successful outcome of the surgical procedure. Before surgery, the patient is given analgesia, fluids, and other medications according to different protocols. After premedication the patient is induced in anaesthesia, intubated, and placed under inhalation anaesthesia using isoflurane/sevoflurane and oxygen. During abdominal surgery, rabbits are positioned similarly to other mammals; they are in dorsal recumbency, in a 10-to-15-degree reverse Trendelenburg position, allowing the liver and stomach to fall slightly away from the diaphragm and aid the respiration. The largest possible incision should be prepared for, and standard patient surgical preparation is undertaken with drapes from various materials. In some cases, magnification is a very useful tool, and head-mounted focal light sources are very important for illuminating deep into the abdominal cavity. The Lone StarTM or other retractor systems are particularly useful, allowing visualization of abdominal organs; moreover, fine, proper surgical instruments are also mandatory. A standard midline incision is made through the skin, subcutis, and linea alba. The skin is extremely fine on the ventral abdomen, and there is often a very small amount of subcutaneous fat present. The abdominal wall should be carefully lifted with fine forceps, and Metzenbaum scissors may be used to make a small incision in the linea alba for entering the abdominal cavity. During surgery, any exposed parts of the gastrointestinal tract should be moistened or covered with surgical swabs soaked with warm fluids. Absorbable materials are recommended in abdominal surgeries in rabbits; braided absorbable suture material like polyglycolic acid for skin and suitable absorbable monofilament materials for internal organs. Rabbits mostly do not traumatize surgical skin incisions, and an Elizabethan collar is not necessary. Moreover, the collar is preventing normal caecotrophy and could damage the backs of the ear pinnae. To conclude, rabbits are commonly presented for a variety of abdominal diseases with an indication for surgical intervention - celiotomy. The most common conditions include reproductive disorders (ovariohysterectomy), gastrointestinal and liver disease (gastrotomy, appendectomy, enterotomy, liver lobectomy), urinary tract problems (cystotomy), and explorative surgery for organ examinations and obtaining biopsies.

Keywords: Rabbit celiotomy, abdominal surgery, anaesthetic management, perioperative care, exotic animal surgery

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Myths and realities about the Carpathian brown bear based on personal experiences

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Starting in 2020, we have been working in three areas of Háromszék County (Transylvania) to observe the feeding, reproduction and social behavior of bears. This covers approximately 2,800 hectares. Daytime and nighttime monitoring is underway at several points in the areas. The results are transferred to a computer and recorded using photographs, short films, infrared and camera traps.

We spent approximately 10,000 hours in nature in good weather, rain, snow, storms and heat waves. During this time, thousands of films, photos or audio recordings have been collected.

The number of individuals observed annually varied between 39 and 58 depending on the seasons, weather, the state of field crop production, and the amount of food.

The feeding habits of bears vary with the season. In spring, they eat almost everything. They graze on a lot of fresh grass. They welcome supplementary feeding (baked goods, emmer wheat - they love it sweetly, sugar beets, apples, etc.). In mid-summer, when the corn in the fields is milky or the sunflowers are ripe, 60-70% of the bears move to the fields and stay there until the harvest. In autumn, when the beech or oak acorn harvest is good, they migrate to the acorn forests to increase their fat stores.

The mating season of the brown bear is the end of May - the first half of June. In this case, the female mates with several males. This is done to protect the cubs, as the males kill the cubs that are not hers and thus provoke the female into another mating. Later, if a male recognizes the mother bear with cubs, he does not harm her cubs. However, if the mother bear is unknown, he kills the cubs without mercy (infanticide).

Although mating occurs in late May or early June, the female bear does not become pregnant immediately. After successful fertilization, implantation in the uterine wall occurs only around November and the actual pregnancy begins, which lasts only 6-8 weeks.

Brown bears sleep in the summer, but not continuously, as in the winter. In fact, the hibernation that used to take place in the winter has been transformed by the lack of harsh, frosty winters. During this period, due to the scarcity of food, bears slow down their metabolism and “set themselves into a state of snoring.”

The following topics will also be discussed in the presentation:

- Territorial dominance, territory defense.
- Coexistence with other species in the same area
- Defense, attack, conflicts with humans
- Conflicts: wounded, cubs, selfie-takers, people walking with dogs in the forest, hand-feeding, forest cyclists-runners, shepherds-shepherds, etc.
- What should and should not be done when encountering a bear
- Current legislation – distract, stun, shoot (shooting quota)
- Shelters
- What would be the solution to the “bear problem”?

Keywords: Brown bear, feeding ecology, reproductive behavior, seasonal activity patterns, human–wildlife conflict

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Tévhitok és valóság a kárpáti barnamedvéről saját tapasztalatok alapján

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A 2020-tól kezdődően a medvék táplálkozásának-, szaporodásának- és szociális viselkedésének megfigyelése céljából Háromszék vármegye (Erdély) három területén dolgozunk. Ez mintegy 2.800 hektárt foglal magába. A területeken több ponton nappali valamint éjszakai monitorizálás van folyamatban. Az eredményeket számítógépre vesszük, fényképek-, rövidfilmek-, infravörös- és kameracsapdák segítségével rögzítjük.

Megközelítőleg 10.000 órát töltöttünk a természetben szép időben, esőben, hóban, viharban, kánikulában. Ezalatt több ezer film, fotó vagy hangfelvétel gyűlt össze.

Az évente megfigyelt egyedek száma 39 és 58 között váltakozott az évszakok-, az időjárás-, a szántóföldi növénytermesztés állapota, valamint a táplálék mennyiség függvényében.

A medvék **táplálkozási szokása** évszakonként változik. Tavasszal szinte mindent elfogyasztanak. Rengeteg friss fűvet le legelnek. Jószívvvel fogadják a póttakarmányozást (pékárut, törökbúzat-imádják cukrosan, cukorrépát, almát stb.). A nyár közepén, amikor a mezőkön tejesre ér a kukorica, vagy beérik a napraforgó, 60-70 %-a a medvéknek levonul a szántóföldekre és itt marad betakarításig. Ősszel, ha jó a bükk-, vagy tölgytermés felvonulnak a makk erdőkbe mintegy a zsiradékraktár növelésre.

A barnamedve **párosodási időszaka** május vége – június első fele. Ilyenkor a nőstény több hímmel is párosodik. Ez a bocsok megvédése érdekében történik, ugyanis a hímek megölik azokat a bocsokat amik nem tőle származnak és ezzel újabb ivarzásra készítetik a nőstényt. A későbbiekben, ha egy hím felismeri a bocsos anyamedvét, ennek bocsait nem bántja. Ha viszont az anyamedve ismeretlen, kímélet nélkül megöli a bocsokat (infanticid jelenség).

Egy másik érdekes jelenség, hogy bár a párosodás május végén, június elején van a nőstény medve nem marad azonnal vemhes. A sikeres megtermékenyítést követően csak november tájékán történik meg a beágyazódás a méhfalba és kezdődik a valódi vemhesség, amely csupán 6-8 hétig tart.

A barna medve nyáron is alszik, de nem folyamatosan, mint télen. Illetve, a valamikori téli álom, a kemény fagyos telek hiányában átalakult. Ebben az időszakban, tekintettel arra, hogy szűkös az élelem, a medvék lelassítják anyagcseréjüket, “beállítják magukat a spórolós üzemmódba”.

Az előadásban még elhangzanak a következő témák :

- Területi dominancia, területvédelem.
- Együttélés más fajokkal ugyanazon a területen
- Védekezés, támadás, konfliktusok az emberekkel
- Konfliktusok: sebesített, bocsos, fotózkodó szelfisek, kutyával az erdőben sétálók, kézből etetők, erdei biciklisek-szaladók, pásztorok-juhászok stb.
- Mit kell és mit nem szabad tenni medvével való találkozásokkor
- Jelenlegi jogszabályok – elzavarni, elkábítani, meglőni (kilövési kvóta)
- Menhelyek
- Mi lenne a megoldás a “medveproblémára”?

Kulcsszavak: Barna medve, táplálkozásökológia, párosodási viselkedés, szezonális aktivitási mintázatok, ember–vadon élő állat konfliktus

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

The Role of Rodents in the Occurrence and Spread of Leptospirosis in Urban Areas

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Leptospirosis is a globally distributed zoonosis caused by pathogenic serovars of *Leptospira interrogans*. The disease affects a wide range of animal species as well as humans, with rodents representing the key reservoirs and sources of infection. The aim of this study was to investigate the incidence and epidemiological characteristics of leptospirosis in the urban area of Sarajevo, with particular emphasis on the role of rodents in its maintenance and spread.

During 2025, a total of 127 human cases of leptospirosis were reported, with males accounting for 63.87% of cases, and the most affected age group being between 25 and 49 years. The results indicate that high rodent population density due to the lack of systematic deratization measures, inadequate control of rodenticide resistance, and ongoing urbanization contribute to an increased risk of disease transmission.

It is necessary to implement integrated rodent control programs, maintain continuous epidemiological surveillance, and provide public education on the risks of contact with potentially contaminated surfaces and water. Furthermore, owners of dogs and cats should be educated about the importance of vaccination against major diseases, with particular attention to zoonoses.

Keywords: leptospirosis, rodents, zoonoses, urbanization, epidemiology

4th “ŠINKOVIĆ” MEMORIAL DAY INVITED LECTURES

Uloga glodara u pojavi i širenju leptospiroze u urbanom području

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Leptospiroza je globalno rasprostranjena zoonoza koju uzrokuju patogeni serovarovi bakterije *Leptospira interrogans*. Bolest pogađa širok spektar životinjskih vrsta i ljudi, a glodari predstavljaju ključne rezervoare i izvore infekcije. Cilj ovog rada bio je ispitati učestalost i epidemiološke karakteristike leptospiroze u urbanom području grada Sarajeva, s posebnim osvrtom na ulogu glodara u njenom održavanju i širenju.

Tokom 2025. godine prijavljeno je 127 slučajeva leptospiroze kod ljudi, od čega je najveći broj (63,87%) oboljelih bio muškog spola, dok je najčešće pogođena starosna grupa bila između 25 i 49 godina. Rezultati ukazuju da visoka gustoća populacije glodara usljed ne provođenja mjera deratizacije, neadekvatna kontrola otpornosti na rodenticide i urbanizacija doprinose povećanom riziku od transmisije bolesti.

Potrebno je uvesti integrisane programe kontrole glodara, kontinuirani epidemiološki nadzor i edukaciju stanovništva o rizicima kontakta s potencijalno kontaminiranim površinama i vodom, vlasnike pasa i mačaka educirati o vrijednostima vakcinacije protiv značajnijih bolesti posebno s osvrtom na zoonoze.

Ključne riječi: leptospiroza, glodari, zoonoze, urbanizacija, epidemiologija

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Veterinary Public Health of Wild Meat in Ghana: A Short Overview

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Generally, the harvesting and trading of wild animals for human consumption are widespread in Africa. It was a reason to conduct a short analysis of the main issues in harvesting, health control and the market of wild meat in Ghana. The data have been collected in a wide international „Survey on Trade, Logistics and Flows of Game Meat“ in the frame of COST Action SafeGameMeat (CA22166).

Hunting as such is regulated in Ghana by the Wildlife Division of the Forestry Commission (WD-FC), an agency under the Ministry of Lands and Natural Resources.

The main laws governing hunting and wildlife use in Ghana include the Wildlife Conservation Regulations, 1971 (L.I. 685) which establishes hunting seasons, prohibited species, and license requirements; the Wildlife Reserves Regulations, 1971 (L.I. 710) which regulates access and activities in protected areas; the Forestry Commission Act, 1999 (Act 571) which establishes the Forestry Commission and mandates it to manage forest and wildlife resources sustainably, and currently the “Wildlife Resource Management Bill” which is going through legislative processes to replace L.I. 685 and related laws. The Bill aims to modernize wildlife governance, emphasizing community-based management and benefit sharing.

Although hunters must obtain a national official hunting license, there are no formal training or tests as a condition for permission to hunt. Young hunters or beginners learn by understudying experienced hunters until they become experienced enough to go on their own expeditions. Hunters can use various methods, including tracking, trapping, stand hunting, and driven hunts, but also snaring for some animal species.

Commonly hunted game species include Grasscutter (*Thryonomys swinderianus*), Maxwell's duiker (*Philantomba maxwellii*), Bushbuck (*Tragelaphus scriptus*) and Togo Hare (*Lepus victoriae*).

The game meat available to non-hunter consumers from supermarkets, butchers or restaurants comes from each of the following sources: Local hunted game meat 95%, Local farmed game meat 2% and Imported hunted game meat 3%. An illegal black market form of game meat also exists in Ghana.

The logistics of game meat trade which refers to the operations and infrastructure needed to collect, store, transport, and distribute game meat from harvest to the final consumer. Hygiene standards during field dressing and carcass transport, Refrigeration and cold chain compliance, Control at game collection points, Certification of cutting and processing plants of game meat, and labelling requirements of game meat were all declared inadequate and created unsafe food chains. We found that the veterinary inspection, official controls and Monitoring and reporting of zoonotic risks were evaluated as adequate.

It could be concluded that an effective control of zoonotic diseases will require more efforts in studying the role of wildlife as a reservoir for zoonoses. This includes epidemiological studies as well as ensuring effective meat inspection of game, implementation of safe game

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handling and evisceration techniques and safe disposal of offal. The latter requires consciousness and compliance of hunters, which has to be based on training and motivation.

Keywords: hunting, bush meat, control, regulations, West Africa

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Veterinarsko javno zdravlje mesa divljači u Gani: kratak pregled

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Generalno, lov i trgovina divljim životinjama za ljudsku ishranu su široko rasprostranjeni u Africi. To je bila motivacija da sprovedemo kratku analizu najvažnijih problema vezanih za lov, zdravstvenu kontrolu i tržište mesa divljači u Gani. Podaci su prikupljeni u okviru šireg međunarodnog istraživanja o trgovini, logistici i tokovima mesa divljači pod okriljem COST akcije *SafeGameMeat* (CA22166).

U osnovi lov u Gani je pod kontrolom Odeljenja za divlje životinje, Komisije za šumarstvo (*WD-FC*), kao agencije u okviru Ministarstva zemljišta i prirodnih resursa. Glavni zakonski propisi koji regulišu lov i korišćenje divljih životinja u Gani uključuju sledeće: Pravilnik o zaštiti divljih životinja iz 1971. godine (*L.I. 685*) koji definiše lovne sezone, listu zabranjenih vrsta i zahteve za licence; Pravilnik o rezervatima divljih životinja iz 1971. (*L.I. 710*) koji reguliše pristup i aktivnosti u zaštićenim područjima; Zakon o komisiji za šumarstvo iz 1999. godine (*Zakon 571*) kojim se osniva Komisija za šumarstvo i nalaže joj da održivo upravljanje šumskim i divljim resursima, a trenutno je u toku procedura za proglašenje „Zakona o upravljanju resursima divljih životinja“ koji bi zamenio Zakon br. 685 i sa njim povezane propise. Cilj ovog zakona je modernizacija upravljanja divljim životinjama, naglašavajući interese lokalnih zajednica i korist za sve učesnike.

Iako lovci moraju da dobiju zvaničnu dozvolu za lov na nacionalnom nivou, ne postoji formalna obuka ili testovi kao uslov za to. Mlade lovce ili početnike podučavaju iskusni lovci dok oni ne postanu dovoljno obučeni da idu samostalno u lov. Lovci mogu koristiti različite tehnike: praćenje, lov sa čeke, lov pogonom ali i hvatanje nekih životinjskih vrsta pomoću različitih zamki.

Radi dobijanja mesa, najviše se love sledeće vrste divljači (poređano u odnosu na količine): Veliki pacov šećerne trske (*Thryonomys swinderianus*), *Maxwell's duiker* mala antilopa (*Philantomba maxwellii*), *Bushbuck* antilopa (*Tragelaphus scriptus*) i Togo zec (*Lepus victoriae*).

Rezultati naše analize pokazali su da meso divljači dostupno potrošačima koji nisu lovci, dolazi do supermarketa, mesara ili restorana iz sledećih izvora: meso lokalno ulovljene divljači 95%, meso lokalno gajene divljači 2% i uvezeno meso ulovljene divljači 3%. U Gani postoji i ilegalna trgovina mesom divljači, odnosno crno tržište.

Logistika u trgovini mesom divljači odnosi na operacije i infrastrukturu potrebnu za sakupljanje, skladištenje, transport i distribuciju mesa divljači od odstrela do krajnjeg potrošača. Prema našem istraživanju: Higijenski standardi tokom obrade na terenu i transport trupova, pravilno hlađenje odnosno hladni lanac, kontrola na mestima za sakupljanje divljači, sertifikacija pogona za sečenje i preradu mesa divljači i zahtevi vezano za obeležavanje mesa divljači mogu se oceniti kao neodgovarajući i dovode do prekida u bezbednom lancu hrane. Utvrdili smo da se veterinarska inspekcija, zvanične kontrole, praćenje i izveštavanje o zoonotskim rizicima mogu oceniti kao adekvatni.

Može se zaključiti da će efikasna kontrola zoonotskih bolesti zahteva više dodatno proučavanje uloge divljih životinja kao rezervoara zoonoza. Ovo uključuje epidemiološke

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studije, kao i obezbeđivanje efikasne inspekcije mesa divljači, sprovođenje tehnika bezbednog rukovanja divljači i evisceracije, kao i odlaganje sporednih proizvoda životinjskog porekla. Sve ovo zahteva podizanje svesti lovaca o navedenim rizicima, što mora biti zasnovano na kontinuiranoj obuci i motivaciji.

Ključne reči: lov, meso divljači, kontrola, regulativa, Zapadna Afrika

Zahvalnica: Ova publikacija je rezultat rada u okviru “COST” akcije pod nazivom Sigurnost u lancu mesa divljači (*SafeGameMeat*), broj “CA22166”, finansijski podržana od strane COST-a (*European Cooperation in Science and Technology*) i donirana od strane Ministarstva Nauke, Tehnološkog razvoja i Inovacija R. Srbije (Ugovor br. 451-03-137/2025-03/ 200117 od 04.02.2025.).

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Equine-Assisted Therapy – Opportunities and Challenges in Practice

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Throughout history, horses have fulfilled various roles, and their use in therapeutic activities is becoming more common in modern society. Equine-assisted therapy (hippotherapy and therapeutic riding) has been shown to have beneficial effects for individuals with neurological, cognitive, and behavioral disorders.

The aim of this study was to investigate the training of therapy horses and the assessment of their welfare, as well as the level of awareness among students, therapists, and therapy users, with a particular focus on practices in the Republic of Serbia.

The study was conducted through anonymous online surveys between October 2023 and January 2024. Three groups of respondents were included: students of veterinary, agricultural, and medical faculties, therapists providing equine-assisted therapy, and therapy users or their parents/guardians. Results show that 42.16% of students were not familiar with the term “hippotherapy,” and 10.49% had not encountered the concept of “animal welfare.” The highest level of awareness regarding hippotherapy was observed among undergraduate students of Animal Production, whereas students from the Faculty of Medicine were the least familiar. Analysis of therapists’ and users’ perspectives revealed that Serbia currently lacks specialized institutions offering equine-assisted therapy, standardized training programs for therapists, and legally defined criteria for the selection and welfare assessment of therapy horses.

The findings highlight considerable opportunities for improvement: increasing awareness among students and the general public, developing standardized and accredited training programs for therapists, and establishing legal guidelines for the assessment and protection of therapy horses’ welfare. Internationally, scoring systems are applied to evaluate horse stress and welfare, ensuring both the protection of horses and the effectiveness of therapy, whereas such standards are not yet implemented locally. Furthermore, the study demonstrates the potential of equine-assisted therapy as an effective adjunct in rehabilitation, while highlighting challenges in its implementation within local institutional and societal contexts.

In conclusion, the successful application of equine-assisted therapy depends on a combination of adequate therapist training, maintenance of animal welfare, and on raising awareness among therapy users and the wider public. This study provides guidance for the further development of this field in Serbia.

Keywords: hippotherapy, therapeutic riding, training of therapists, horse welfare

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Terapija uz pomoć konja - mogućnosti i izazovi u praksi

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Konji su se kroz istoriju koristili u različite svrhe, a u savremenom društvu njihova primena sve više obuhvata i terapijske aktivnosti. Terapija uz pomoć konja (hipoterapija i terapijsko jahanje) pokazuje zapažene efekte u podršci osobama sa neurološkim, kognitivnim i bihevioralnim poremećajima

Cilj ovog istraživanja bio je da se ispita obuka terapijskih konja i procena njihove dobrobiti, kao i nivo informisanosti studenata, terapeuta i korisnika terapija o ovoj temi, sa posebnim osvrtom na praksu u Republici Srbiji.

Istraživanje je sprovedeno putem anonimnih online anketa, u periodu od oktobra 2023. do januara 2024. godine. Ankete su obuhvatile tri grupe ispitanika: studente veterinarskih, poljoprivrednih i medicinskih fakulteta, terapeuta koji sprovode terapiju uz pomoć konja i korisnike terapija ili njihove roditelje/staratelje. Rezultati pokazuju da 42,16% studenata nije upoznato sa pojmom hipoterapije, a 10,49% se do sada nije susrelo sa terminom „dobrobit životinja“. Najviši nivo informisanosti o hipoterapiji imaju studenti Osnovnih akademskih studija Animalna proizvodnja, dok su studenti Medicinskog fakulteta najmanje upoznati. Analiza odgovora terapeuta i korisnika otkriva da u Srbiji ne postoje specijalizovane institucije za sprovođenje terapije uz pomoć konja, sistematizovana obuka terapeuta ili zakonski propisani kriterijumi za izbor i procenu terapijskih konja.

Rezultati istraživanja ukazuju na postojanje značajnog prostora za unapređenje: povećanje informisanosti studenata i javnosti, razvoj standardizovane i akreditovane obuke za terapeuta, definisanje zakonskih smernica za procenu i očuvanje dobrobiti terapijskih konja. U svetu se koriste scoring sistemi za procenu stresa i dobrobiti konja kako bi se osigurala njihova zaštita i efikasnost terapije, dok takvi standardi u našoj zemlji još uvek nisu implementirani. Pored toga, istraživanje pokazuje potencijal terapije uz pomoć konja kao efikasnog dodatka u rehabilitaciji, ali i izazove u njenoj primeni u lokalnom institucionalnom i društvenom kontekstu.

Iz svega navedenog može da se zaključi da uspešna primena terapije uz pomoć konja zavisi od kombinacije adekvatne obuke terapeuta, očuvanja dobrobiti životinja i bolje informisanosti korisnika i šire javnosti. Sprovedeno istraživanje pruža smernice za dalji razvoj ove oblasti u Srbiji.

Ključne reči: hipoterapija, terapijsko jahanje, obuka terapeuta, dobrobit konja

Zahvalnost: Rad je podržan sredstvima Ministarstva nauke, tehnološkog razvoja i inovacija Republike Srbije (Ugovor br. 451-03-137/2025-03/200117). Autori se zahvaljuju svima koji su doprineli sprovođenju istraživanja, posebno prof. dr Zagorki Lozanov Crvenković na pomoći u statističkoj obradi podataka, dr med. sci. Zoranu Budimliji na stručnoj podršci, studentima, terapeutima, članovima konjičkih klubova, kao i roditeljima/starateljima korisnika terapije.

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Pseudopregnancy in Mares

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The reproductive cycle of mares represents a complex physiological process influenced by numerous hormonal, metabolic, and external factors. Any disturbance in hormonal balance can result in deviations from the normal cycle and the development of various reproductive dysfunctions. Pseudopregnancy, as one of the most significant reproductive disorders in mares, is a pathological condition in which animals exhibit signs of pregnancy despite the absence of fertilization and embryo development. This condition results from a disruption in hormonal balance, leading to a prolonged luteal phase and maintenance of elevated progesterone levels in the blood. Based on the available literature, the most common cause of pseudopregnancy is a persistent corpus luteum, which continues to secrete progesterone even though pregnancy is not present. This disorder may be caused by insufficient production of prostaglandins (PGF2 α) by the endometrium, a hormone that normally induces regression of the corpus luteum. Early embryonic death, occurring between the 10th and 30th day of gestation, can also lead to retention of the corpus luteum and the development of pseudopregnancy. Inflammatory processes of the uterus, endometrial cysts, as well as the mare's age and weakening of hormonal regulation, further increase the risk of this condition. In addition, certain endocrine and neoplastic disorders can contribute to the development of pseudopregnancy. Thyroid dysfunction, particularly hypothyroidism, may affect hormonal balance and prolong corpus luteum activity, while ovarian tumors, such as granulosa-theca cell tumors, can mimic pregnancy due to secretion of estrogen, inhibin, and progesterone. Less commonly, changes in the pituitary and adrenal glands, as well as prolonged prolactin activity, may contribute to the appearance of pseudopregnancy-like symptoms. Hormonal imbalance can also be caused by stress factors such as transport, changes in diet, or housing conditions, while a diet rich in phytoestrogens and stimulation of the mammary gland may contribute to the development of pseudopregnancy symptoms. Prolonged progesterone activity results in estrus suppression, and mammary gland development may also occur. Ultrasound examination of the uterus and ovaries is the most reliable diagnostic method for identifying these conditions. Diagnosis of pseudopregnancy is based on ultrasonography, which confirms the presence of a persistent corpus luteum in the absence of an embryo, as well as possible inflammatory changes in the uterus or neoplastic changes in the ovaries. Elevated serum progesterone levels, determined by hormonal analysis, further confirm active luteal phase. Differentiating pseudopregnancy from early pregnancy, early embryonic death, endometritis, and pyometra is of great importance, as all these conditions can produce similar symptoms and estrus suppression. In cases of persistent corpus luteum, prostaglandin (PGF2 α) therapy is applied, which induces luteolysis and allows the mare to return to a normal estrous cycle. It has been shown that limiting food rich in phytoestrogens, as well as reducing the intake of concentrated feed and water, is effective in decreasing mammary gland secretion. The prognosis for pseudopregnancy is generally favorable, as most mares successfully return to the reproductive cycle following treatment, if the cause is based on a persistent corpus luteum. Prevention includes early ultrasound diagnosis of pregnancy, timely treatment of endometritis, and control of feed quality to avoid excessive intake of phytoestrogens. Providing stable housing conditions and reducing stressors significantly contribute to hormonal balance and proper reproductive cycling. Although rare, pseudopregnancy in mares is a clinically significant disorder, and timely diagnosis and appropriate therapy are crucial for restoring the mare to a normal reproductive rhythm.

Keywords: mare pregnancy, progesterone, prostaglandin (PGF2 α), pseudopregnancy

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Pseudograviditet kobilu

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Reproduktivni ciklus kobilu predstavlja složen fiziološki proces pod uticajem brojnih hormonskih, metaboličkih i spoljašnjih faktora. Bilo koji poremećaj u endokrinoj regulaciji može rezultirati odstupanjima od normalnog ciklusa i razvojem različitih reproduktivnih disfunkcija. Pseudograviditet, kao jedan od značajnijih reproduktivnih poremećaja kod kobilu, predstavlja patološko stanje u kojem životinje ispoljavaju znake graviditeta, iako do oplodnje i razvoja embriona nije došlo. Ovo stanje je posledica poremećaja u hormonskoj ravnoteži, koji dovodi do produžene lutealne faze i održavanja povišenog nivoa progesterona u krvi. Na osnovu dostupne literature, najčešći uzrok pseudograviditeta je perzistentno žuto telo, koje nastavlja da luči progesteron, iako graviditet nije prisutan. Ovaj poremećaj može biti posledica nedovoljne produkcije prostaglandina ($PGF2\alpha$) od strane endometrija materice, hormona koji u normalnim uslovima dovodi do regresije žutog tela. Rano embrionalno uginuće, između 10. i 30. dana gestacije, takođe može dovesti do zadržavanja žutog tela i razvoja lažnog graviditeta. Zapaljenski procesi materice, ciste endometrija, kao i starost kobile i slabljenje hormonske regulacije, dodatno povećavaju rizik od nastanka ovog stanja. Pored navedenih, određeni endokrini i neoplastični poremećaji takođe mogu doprineti razvoju pseudograviditeta. Poremećaj funkcije štitne žlezde, naročito hipotireoza, može uticati na hormonsku ravnotežu i produženu aktivnost žutog tela, dok tumori jajnika, poput granulosa-teka ćelijskog tumora, mogu imitirati stanje graviditeta usled sekrecije estrogena, inhibina i progesterona. Ređe, promene na hipofizi i nadbubrežnim žlezdama, kao i produženo delovanje prolaktina, mogu doprineti pojavi simptoma sličnih pseudograviditetu. Hormonski disbalans može biti uzrokovan i stresogenim faktorima, kao što su transport, promene u ishrani ili uslovima držanja, dok ishrana bogata fitoestrogenima i stimulacija mlečne žlezde mogu doprineti razvoju simptoma pseudograviditeta. Produženo dejstvo progesterona uzrokuje izostanak estrusa, uz mogućnost aktivacije mlečne žlezde. Ultrazvučni pregled materice i jajnika predstavlja najpouzdaniju dijagnostičku metodu za utvrđivanje ovih stanja. Dijagnoza pseudograviditeta se zasniva na ultrazvučnom pregledu, kojim se potvrđuje postojanje perzistentnog žutog tela uz odsustvo embriona, kao i mogućih zapaljenskih promena na materici ili neoplastičnih promena na jajnicima. Povišen nivo progesterona u serumu, utvrđen hormonskom analizom, dodatno potvrđuje aktivnu lutealnu fazu. Razlikovanje pseudograviditeta od ranog graviditeta, ranog embrionalnog uginuća, endometritisa i piometre od velikog je značaja, jer sva ova stanja mogu uzrokovati slične simptome i izostanak estrusa. U slučaju postojanja perzistentnog žutog tela primenjuje se terapija prostaglandinom ($PGF2\alpha$), koji izaziva luteolizu i omogućava povratak kobile u normalan estrusni ciklus. Pokazalo se da je ograničavanje hrane bogate fitoestrogenima, kao i redukcija unosa koncentrovane hrane i vode, efektivno u smanjenju sekrecije mlečne žlezde. Prognoza pseudograviditeta je uglavnom povoljna jer se većina kobilu nakon tretmana uspešno vraća u reproduktivni ciklus, ukoliko se uzrok bazira na perzistentnom žutom telu. Prevencija obuhvata ranu ultrazvučnu dijagnostiku graviditeta, pravovremeno lečenje endometritisa, kao i kontrolu kvaliteta ishrane radi izbegavanja prevelikog unosa fitoestrogena. Obezbeđivanje optimalnih uslova držanja i smanjenje stresora značajno doprinose hormonskoj stabilnosti i pravilnom reproduktivnom ciklusu. Iako je redak, pseudograviditet kobilu predstavlja klinički značajan poremećaj, te pravovremena dijagnostika i adekvatna terapija imaju ključnu ulogu u povratku kobile u fiziološki reproduktivni ritam.

Ključne reči: graviditet kobilu, progesteron, prostaglandin ($PGF2\alpha$), pseudograviditet

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The Influence of Subacute Ruminal Acidosis on the Concentration of Calcium, Magnesium and Phosphorus in the Blood Serum of Sheep

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Subacute ruminal acidosis represents a form of indigestion that occurs in ruminants, most often as a consequence of inadequate management and feeding practices. Intensive sheep farming, especially of fattening breeds, frequently involves the use of larger amounts of concentrated feed with a reduced proportion of roughage in the diet. Due to their anatomical and physiological characteristics, ruminants require a minimum of 20% roughage in their ration. A reduced proportion of roughage and an increased amount of concentrates lead to disturbances in the rumen microflora as well as a decrease in ruminal pH, all of which affect rumen motility and result in indigestion. Subacute ruminal acidosis, which occurs as a consequence of an unbalanced diet and increased intake of concentrates, leads to reduced feed consumption, loss of appetite, and malabsorption in the digestive tract. This can cause disturbances in the overall health status as well as certain metabolic disorders. The aim of this study was to examine the influence of subacute ruminal acidosis on the concentration of calcium, magnesium, and phosphorus in the serum of sheep. The experiment was conducted on a farm of Wurttemberg-breed sheep in Vojvodina kept under intensive production conditions. Two groups of sheep were included: the first group was fed a larger amount of concentrates and was diagnosed with subacute ruminal acidosis, while the second group was fed a larger proportion of roughage and did not show signs of subacute ruminal acidosis. After blood sampling and statistical analysis of the obtained results, significantly lower concentrations of calcium and magnesium, as well as significantly higher concentrations of phosphorus, were recorded in sheep with subacute ruminal acidosis compared to healthy sheep. Based on the obtained results, it can be concluded that subacute ruminal acidosis has a significant effect on the mineral metabolism of sheep. This means that proper ration balancing and adequate nutrition have an important impact on the overall health status of sheep, particularly on the mineral status of the organism.

Keywords: sheep, acidosis, calcium, phosphorus, magnesium

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Uticaj subakutne acidoze buraga na koncentraciju kalcijuma, magnezijuma i fosfora u krvnom serumu ovaca

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Subakutna acidoza buraga predstavlja indigestiju koja se javlja kod preživara najčešće kao posledica neadekvatnog načina držanja i ishrane. Intenzivno ovčarstvo posebno tovnih rasa ovaca često uključuje upotrebu veće količine koncentrovane hrane u ishrani sa smanjenim udelom kabastog dela obroka. Preživari zbog svojih anatomskih i fizioloških karakteristika digestivnog trakta zahtevaju minimum 20% kabaste hrane u obroku. Smanjen udeo kabaste hrane, a povećan udeo koncentrata dovodi do poremećaja mikroflore u buragu kao i do pada pH vrednosti buražnog sadržaja što sve zajedno utiče na motoriku buraga i dovodi do nastanka indigestija. Subakutna acidoza buraga koja nastaje kao posledica neizbalansiranog obroka i povećanog unosa koncentrata dovodi do smanjenja konzumacije hrane, gubitka apetita i malapsorpcije u digestivnom traktu, što može da dovode do poremećaja opšteg zdravstvenog stanja kao i određenih metaboličkih poremećaja. Cilj ovog rada je bio da se ispita uticaj subakutne acidoze buraga na koncentraciju kalcijuma, magnezijuma i fosfora u serumu ovaca. Ogled je izveden na farmi ovaca Virtemberg rase u Vojvodini koje se drže u intenzivnom uzgoju. U ogled su uključene dve grupe ovaca, prva grupa ovaca hranjenih sa većom količinom koncentrata kod kojih je dijagnostikovana subakutna acidoza buraga, kao i druga grupa ovaca hranjena sa većom količinom kabaste hrane kod kojih nije utvrđena subakutna acidoza buraga. Nakon uzorkovanja krvi i statističke obrade dobijenih rezultata, zabeležena je statistički značajno niža koncentracija kalcijuma i magnezijuma, kao i značajno veća koncentracija fosfora u krvnom serumu ovaca sa subakutnom acidozom buraga u odnosu na zdrave ovce. Na osnovu dobijenih rezultata, može se zaključiti da subakutna acidoza buraga značajno utiče na metabolizam mineralnih materija kod ovaca. To znači da balansiranje obroka i adekvatna ishrana imaju značajan uticaj na opšte zdravstveno stanje ovaca, a posebno na mineralni metabolizam.

Ključne reči: ovce, acidoza, kalcijum, fosfor, magnezijum

Zahvalnost: Rad je podržan sredstvima Ministarstva nauke, tehnološkog razvoja i inovacija Republike Srbije (Ugovor br. 451-03-137/2025-03/200117).

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Production of Goat Milk in Serbia – Opportunities and Challenges

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Goat milk represents a valuable nutritional resource for humans, especially for children and individuals with lactose intolerance. Compared to cow milk, it is more easily digestible and possesses several therapeutically significant properties relevant to medicine and nutrition.

Based on research conducted in 2025 in the area of Novi Sad, it was concluded that there is a limited number of producers engaged in the production and sale of goat milk. The attitudes of respondents indicated the existence of consumer interest, which is selective and varies throughout the year. In addition, the results showed a high level of producer awareness regarding product quality, food safety, and control measures. Although there is a constant demand, milk availability is seasonal, and small quantities together with specific rearing conditions further limit the market. Earlier research on consumer attitudes in Vojvodina also showed that buyers of goat milk most value quality, freshness, and direct contact with the producer. It was also recognized that a portion of consumers choose goat milk for health-related reasons, while another segment is motivated by the desire for local, authentic products.

The Rulebook on the Quality of Raw Milk in Serbia recognizes goat milk together with cow and sheep milk, while the category of “milk of other domestic animals” includes donkey, mare, and buffalo milk. For goat and sheep milk, no limit for the somatic cell count is prescribed. This places additional responsibility on goat-milk producers, who must apply good manufacturing practices, carefully monitor milking hygiene, and the health status of lactating goats in order to ensure the safety of goat milk for consumers. Goat milk is often preferred by consumers in its raw form, which introduces an additional risk.

Education and continuous professional training of producers, as well as consumers, represent key factors in the development of the goat-milk market. Clear information on health benefits and risk assessment related to goat-milk consumption may increase consumer confidence and enable broader use of goat milk and goat-milk products. Further research is necessary to better define quality standards, improve production, and evaluate the health and functional properties of goat milk.

In perspective, a combination of stable demand, responsible production, and education may contribute to the sustainable development of the goat-milk sector in Serbia. Clearly defined regulatory frameworks, accompanied by continuous research and improvement of on-farm practices, are essential to ensure high product quality, consumer safety, and market expansion, making goat milk a recognizable and valued segment of the domestic food industry.

Keywords: goat milk, food safety, regulation, market

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Proizvodnja kozjeg mleka u Srbiji – mogućnosti i izazovi

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Kozje mleko predstavlja vredan nutritivni resurs za ljude, posebno za decu i osobe sa intolerancijom na laktozu. U poređenju sa kravljim mlekom, lakše se vari, a poseduje i nekoliko terapijski značajnih svojstava relevantnih za medicinu i ishranu.

Na osnovu istraživanja sprovedenog 2025. godine na teritoriji Novog Sada zaključeno je da postoji ograničen broj proizvođača koji se bave proizvodnjom i prodajom kozjeg mleka. Stavovi ispitanika ukazali su na postojanje potrošačkog interesovanja, koje je selektivno i varira tokom godine. Pored toga, rezultati su pokazali visok nivo svesti proizvođača o kvalitetu proizvoda, bezbednosti hrane i merama kontrole. Iako postoji stalna potražnja, dostupnost mleka je sezonska, a male količine i specifični uslovi uzgoja dodatno ograničavaju tržište. Ranija istraživanja stavova potrošača u Vojvodini takođe su pokazala da kupci kozjeg mleka najviše vrednuju kvalitet, svežinu i direktan odnos sa proizvođačem. Prepoznato je i da deo potrošača kozje mleko bira iz zdravstvenih razloga, dok drugi segment kupaca motiviše želja za lokalnim, autentičnim proizvodima.

Pravilnik o kvalitetu sirovog mleka u Srbiji prepoznaje kozje mleko zajedno sa kravljim i ovčijim, dok u kategoriju „mleka ostalih domaćih životinja“ spadaju magareće, kobilje i bivolje mleko. Za kozje i ovčije mleko, nije propisana granica za broj somatskih ćelija. To stavlja dodatnu odgovornost na proizvođače kozjeg mleka, koji svakako moraju da primenjuju dobru proizvođačku praksu, pažljivo prate higijenu muže i zdravstveni status koza u laktaciji, kako bi osigurali bezbednost kozjeg mleka za potrošače. Kozje mleko potrošači često žele da konzumiraju sirovo, što predstavlja dodatni rizik.

Edukacija i kontinuirano stručno usavršavanje proizvođača, ali i potrošača, predstavljaju ključne faktore u razvoju tržišta kozjeg mleka. Jasne informacije o zdravstvenim benefitima i analizi rizika upotrebe kozjeg mleka mogu povećati poverenje potrošača i omogućiti širu upotrebu kozjeg mleka i proizvoda od kozjeg mleka. Dalja istraživanja su neophodna kako bi se bolje definisali standardi kvaliteta, unapredila proizvodnja i procenila zdravstvena i funkcionalna svojstva kozjeg mleka.

U perspektivi, kombinacija stabilne potražnje, odgovorne proizvodnje i edukacije može doprineti održivom razvoju sektora kozjeg mleka u Srbiji. Jasno definisani regulatorni okviri, praćeni kontinuiranim istraživanjima i unapređenjem praksi na farmama, ključni su za osiguranje visokog kvaliteta proizvoda, bezbednosti potrošača i širenja tržišta, čime kozje mleko može postati prepoznatljiv i cenjen segment domaće prehrambene industrije.

Ključne reči: kozje mleko, bezbednost hrane, regulativa, tržište

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**Cost-Benefit Assessment of the Use of Essential Oils in the Control of Poultry
Colibacillosis as an Alternative to Antibiotics – Theoretical Framework**

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Poultry colibacillosis, caused by pathogenic strains of *Escherichia coli*, represents one of the most common bacterial diseases in intensive poultry production, with a significant negative impact on animal health, production parameters, and the economic sustainability of farms. In practice, the therapeutic approach is predominantly based on the use of antibiotics, whose excessive and irrational application contributes to the development of antimicrobial resistance (AMR), thereby threatening animal and human health, as well as the safety of food of animal origin. In this context, essential oils are increasingly being considered as natural alternatives to antibiotics due to their antimicrobial, anti-inflammatory, and immunomodulatory properties. However, in addition to evaluating their biological efficacy, it is necessary to consider the economic aspect of their application, which is achieved through pharmacoeconomic analysis, namely the assessment of the cost-benefit ratio. This approach to the control of poultry colibacillosis involves the identification of all relevant direct and indirect costs associated with treatment. At the same time, the expected benefits are assessed in terms of improved health status, reduced occurrence of clinical symptoms, enhanced productivity, and decreased need for antibiotic use. The application of the cost-benefit assessment approach enables a theoretical comparison between conventional antibiotic therapy and alternative essential oil-based preparations, with the aim of determining their potential cost-effectiveness and sustainability under modern poultry production conditions. Such an approach represents a significant tool for rational decision-making in veterinary practice and contributes to the development of strategies aimed at reducing antibiotic use and controlling the spread of AMR, in accordance with the One Health concept.

Keywords: colibacillosis, essential oils, costs, poultry production, antimicrobial resistance

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Procena odnosa troškova i koristi primene etarskih ulja u kontroli kolibaciloze živine kao alternative antibioticima – teorijski osnov

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Kolibaciloza živine, izazvana patogenim sojevima *Escherichia coli*, predstavlja jedno od najčešćih bakterijskih oboljenja u intenzivnoj živinarskoj proizvodnji, sa značajnim negativnim uticajem na zdravstveno stanje, produktivne parametre i ekonomsku održivost farmi. Terapijski pristup se u praksi uglavnom zasniva na primeni antibiotika, čija prekomerna i neracionalna upotreba doprinosi razvoju antimikrobne rezistencije (AMR), čime se ugrožava zdravlje životinja i ljudi, kao i bezbednost proizvoda životinjskog porekla. U tom kontekstu, etarska ulja se sve više razmatraju kao prirodna alternativa antibioticima, zahvaljujući njihovom antimikrobnom, antiinflamatornom i imunomodulatornom dejstvu. Međutim, pored procene njihove biološke efikasnosti, neophodno je sagledati i ekonomski aspekt njihove primene, što se postiže farmakoekonomskom analizom, odnosno procenom odnosa troškova i koristi. Ovaj pristup u kontroli kolibaciloze živine podrazumeva identifikaciju svih relevantnih direktnih i indirektnih troškova povezanih sa terapijom. Istovremeno, procenjuju se očekivane koristi u vidu poboljšanja zdravstvenog statusa, smanjenja pojave kliničkih simptoma, bolje produktivnosti i smanjenja potrebe za primenom antibiotika. Primena pristupa procene troškova i koristi omogućava teorijsko poređenje konvencionalne antibiotske terapije i alternativnih preparata na bazi etarskih ulja, sa ciljem utvrđivanja njihove potencijalne isplativosti i održivosti u uslovima savremene živinarske proizvodnje. Ovakav pristup predstavlja značajan alat za donošenje racionalnih odluka u veterinarskoj praksi i doprinosi razvoju strategija usmerenih ka smanjenju upotrebe antibiotika i kontroli širenja AMR, u skladu sa konceptom Jedno zdravlje.

Ključne reči: kolibaciloza, etarska ulja, troškovi, živinarstvo, antimikrobna rezistencija

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Fetal Death Caused by *Salmonella enterica* subsp. *houtenae* in a Green Anaconda (*Eunectes murinus*)

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Salmonella species are frequently present in the intestinal tract of reptiles without causing clinical signs. However, in some cases, the bacteria can enter the bloodstream and colonize the organs, causing inflammatory and necrotic changes. This can lead to lesions in the ovaries, testicles, kidneys, liver, and sometimes in the bones. In reptiles, a predisposing factor is always necessary for the development of the disease, which can usually be traced back to errors in transportation or husbandry.

The carcass of a gravid female green anaconda was sent to the Department of Exotic Animal-, Wildlife-, Fish- and Honeybee Medicine for pathological examination. At the time of the dissection, there were 17 dead and partially macerated fetuses in the oviduct. During bacteriological examination of the fetuses' bodies under aerobic conditions at 26 °C, *Salmonella* sp. was identified based on the morphological, growth, and biochemical characteristics of the colonies. The isolated bacteria were sent to the National Reference Laboratory for Microbiology of the Food Chain Safety Laboratory Directorate of the National Food Chain Safety Office, where the serotype was determined according to the MSZ CEN ISO/TR 6579-3:2014 method. As a result, *Salmonella enterica* subspecies *houtenae* (IV.) 38:z4,z23:- was identified.

The excessive cooling of the terrarium air caused by a cold front may have contributed to the overgrowth of bacteria and the death of the fetuses. The specimens' terrarium did not have adequate heating; for this reason, it was unable to maintain the correct temperature due to the cold front.

Keywords: gravid reptile, intrauterine infection, *Salmonella enterica*, necropsy, husbandry conditions

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***Salmonella enterica* subspecies *houtenae* okozta magzat elhalás nagy anakondában (*Eunectes murinus*)**

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Hüllőkben a salmonella baktériumok gyakran tünetmentesen jelen lehetnek a bélcsatornában. Azonban néhány esetben a baktériumok bekerülhetnek a vérkeringésükbe és a szerveikben megtelepedve ott gyulladásos-elhalásos folyamatok alakulnak ki. Így petefészekben, herében, vesében, májban, olykor csontban alakulhat ki elváltozás. A hüllőkben a megbetegedés kialakulásához minden esetben hajlamosító tényező szükséges, ami legtöbbször szállítási, tartási hibákra vezethető vissza.

Az Egzotikusállat-, Vad-, Hal- és Méhegészségügyi Tanszékre egy kifejlett, nagy anakonda nőtény teteme került kórbonctani vizsgálatra. A tetem boncolásakor a tojócsőben 17, elhalt és részben macerálódásnak indult magzat volt. A magzatok testéből aerob viszonyok között, 26 °C-on végzett bakteriológiai vizsgálat során a telep morfológiai, növekedési és biokémiai sajátosságok alapján *Salmonella* sp. került azonosításra. Az izolált baktériumokat Nemzeti Élelmiszerlánc-biztonsági Hivatal Élelmiszerlánc-biztonsági Laboratórium Igazgatóság Mikrobiológiai Nemzeti Referencia Laboratóriumába küldtük, ahol a MSZ CEN ISO/TR 6579-3:2014 módszer szerint meghatározták a szerotípusát. Ennek eredményeként *Salmonella enterica* subspecies *houtenae* (IV.) 38:z4,z23:- került azonosításra.

A baktériumok elszaporodásához és a magzatok elhalásához hajlamosító tényezőként a terrárium levegőjének a túlzott lehülése járulhatott hozzá, amit egy hidegfront okozott. A kigyó tartó terráriumában nem volt megfelelő fűtés, ami a jelentős lehülést nem tudta megfelelő hőmérsékleti értéken tartani.

Kulcsszavak: vemhes hüllő, méhfertőzés, *Salmonella enterica*, boncolás, tartási körülmények

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Dystocia in Reptiles

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Dystocia (*dystocia*) in reptiles refers to difficult or inhibited expulsion of eggs, or fetuses, from the reproductive tract within the normal physiological timeframe. It occurs in female oviparous and viviparous reptiles - most often in turtles, but also in lizards (especially geckos and chameleons) and snakes. In most reptiles, egg laying occurs 4-6 weeks after ovulation. If the eggs are retained longer, or if the female shows signs of stress without success, dystocia is suspected. This disorder can be of a mechanical nature (impossibility of egg/fetus passage through the fallopian tube or cloaca), functional nature (egg/fetus retention due to fallopian tube atony) and mixed nature (combination of the first two), and is considered a multi-causal disease. In etiology the main role is played by inadequate housing conditions (terrarium microclimate, quality and availability of food and drinking water) in combination with anatomical and metabolic deficiencies of female reptiles. Clinical signs depend on the severity of the condition and usually include reduced activity, poor condition, lethargy, unsuccessful straining to lay eggs and possible changes in general state of animal. When palpating the abdominal region, it is easy to identify oval masses, which actually represent eggs left behind in the fallopian tube. Because of egg retention, secondary infections often occur (metritis, salpingitis, peritonitis), and due to egg rupture, the development of peritonitis is also possible. Too frequent and excessive stress often leads to prolapse of the cloaca or oviduct, while the final complications include necrosis of the oviduct and cloaca, the occurrence of septicemic shock and death if the animal is not provided with appropriate therapy and care. Diagnosis is based on anamnestic data and clinical examination, while X-ray and ultrasound allow reliable confirmation of egg retention in the fallopian tube or cloaca. The therapy is directly related to the timely and accurate diagnosis of this disease, so the conservative therapeutic protocol is based on the correction of the individual's living conditions (optimization of temperature, humidity, use of infusion solutions for rehydration, addition of vitamin D3 and calcium preparations in the diet, as well as the use of oxytocin to stimulate the smooth muscles of the fallopian tubes). This approach can be effective if there is no mechanical obstruction of the fallopian tubes. Another type of therapeutic protocol is based on the manual extraction of eggs from the fallopian tubes or cloaca using a lubricant (paraffin or vaseline), with gentle massage of the cloaca. In cases where conservative therapeutic protocol did not give good results in the first 48 hours from the start of its application, a surgical procedure is performed (salpingotomy or salpingectomy, with physical egg extraction). Egg retention is a common occurrence in reptiles kept in zoos or as pets, and is of serious clinical importance as a disease that can easily impair the total quality of life of reptiles in captivity. For this reason, the main emphasis is placed on timely diagnosis, as well as the correct selection of the appropriate therapeutic protocol. In order to avoid this disorder, it is necessary that the animal has optimal living conditions (environment, temperature, lighting, humidity, easily accessible drinking water), properly formulated food (enough calcium and vitamin D3), as few stressful situations and stressogenic factors as possible, a suitable place for laying eggs, as well as regular veterinary

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examinations. The aim of this work is to emphasize the importance of dystocia in reptiles, as well as to explain the mechanisms of the occurrence of this disease, and to emphasize the importance of timely diagnosis, selection of the appropriate therapeutic protocol, compliance with optimal living conditions and knowledge of the physiological characteristics of different types of reptiles. All of this is primarily aimed at optimizing the quality of life of reptiles, both pets and regular residents of numerous zoos around the world.

Keywords: reptiles, dystocia, egg extraction, salpingotomy;

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Distokija (*dystocia*) kod gmizavaca označava otežano ili onemogućeno izbacivanje jaja, odnosno fetusa, iz reproduktivnog trakta u fiziološkom vremenskom okviru. Javlja se kod ženki oviparnih i viviparnih reptila – najčešće kod kornjača, al i guštera (posebno gekona i kameleona) i zmija. Kod većine reptila, polaganje jaja se dešava 4-6 nedelja nakon ovulacije. Ako se jaja zadrže duže, ili ukoliko ženka pokazuje znake naprezanja bez uspeha, postavlja se sumnja na distokiju. Ovaj poremećaj može biti mehaničke prirode (nemogućnost prolaska jaja/fetusa kroz jajovod ili kloaku), funkcionalne prirode (retencija jaja/fetusa usled atonije jajovoda) i mešovite prirode (kombinacija prva dva), te se smatra multikauzalnim oboljenjem. U etiologiji glavnu ulogu igraju neadekvatni uslovi držanja (mikroklimat terarijuma, kvalitet i pristupačnost hrane i pijeće vode) u kombinaciji sa anatomskim i metaboličkim nedostacima ženki reptila. Klinički znaci zavise od težine stanja i obično uključuju smanjenu aktivnost, lošu kondiciju, letargiju, bezuspešno napinjanje u cilju polaganja jaja i moguće promene opšteg stanja. Pri palpaciji abdominalne regije, lako se utvrđuju ovalne mase, koje zapravo predstavljaju jaja zaostala u jajovodu. Zbog retencije jaja često dolazi do sekundarnih infekcija (metritisa, salpingitisa, peritonitisa), a usled rupture jaja, moguć je i razvoj peritonitisa. Prečesta i prejaka naprezanja neretko dovode do prolapsusa kloake ili jajovoda, dok krajnje komplikacije uključuju nekrozu jajovoda i kloake, pojavu septikemičnog šoka i uginjavanje, ukoliko životinji nije pružena odgovarajuća terapija i nega. Dijagnostika se zasniva na anamnestičkim podacima i kliničkom pregledu, dok rendgen i ultrazvuk omogućavaju pouzdanu potvrdu retencije jaja u jajovodu ili kloaki. Terapija je direktno povezana sa pravovremenom preciznom dijagnostikom ovog oboljenja, pa se tako, konzervativni terapijski protokol bazira na korekciji životnih uslova jedinke (optimizacija temperature, vlažnosti, primena infuzionih rastvora za rehidrataciju, dodatak vitamina D3 i kalcijumovih preparata u ishrani, kao i primena oksitocina za podsticanje rada glatke muskulature jajovoda). Ovaj pristup može biti delotvoran ukoliko nije došlo do mehaničke opstrukcije jajovoda. Drugi tip terapijskog protokola se bazira na manuelnoj ekstrakciji jaja iz jajovoda ili kloake upotrebom lubrikanta (parafin ili vazelin), uz nežnu masažu kloake. U slučaju da konzervativni terapijski protokol nije dao dobre rezultate u prvih 48h od početka primene istog, pristupa se hirurškom zahvatu (salpingotomija ili salpingektomija, uz fizičku ekstrakciju jaja). Retencija jaja je česta pojava kod gmizavaca koji se drže u zoološkim vrtovima ili kao kućni ljubimci, i pridodaje joj se ozbiljan klinički značaj kao oboljenju koje lako može da naruši kompletan kvalitet života gmizavaca u zatočeništvu. Iz tog razloga, glavni akcenat stavlja se na pravovremenu dijagnostiku, kao i pravilan odabir odgovarajućeg terapijskog protokola. Da bi se ovaj poremećaj izbegao, neophodno je da životinja ima optimalne uslove života (okruženje, temperatura, osvetljenje, vlažnost, nesmetan pristup vodi za piće), pravilno koncipiranu hranu (dovoljno kalcijuma i vitamina D3), što manje stresnih situacija i stresogenih faktora, pogodno mesto za polaganje jaja, kao i redovne veterinarske preglede. Cilj ovog rada jeste da se istakne značaj distokije kod gmizavaca, kao i da se objasne mehanizmi nastanka ovog oboljenja, i naglasi važnost pravovremene

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dijagnostike, odabira odgovarajućeg terapijskog protokola, poštovanje optimalnih uslova života i poznavanja fizioloških karakteristika različitih vrsta gmizavaca. Sve to ima za cilj prvenstveno optimizaciju kvaliteta života gmizavaca, kako kućnih ljubimaca, tako i redovnih stanovnika mnogobrojnih zooloških vrtova širom sveta.

Ključne reči: gmizavci, distokija, ekstrakcija jaja, salpingotomija

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Urolithiasis in Guinea Pigs

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One of the most common diseases of guinea pigs is urolithiasis, which can have many causes. It usually occurs in animals older than 2 years. According to literature data, 90% of urinary stones are calcium carbonate. The location of urinary stones is very diverse, so they can be found in any part of the urinary tract. Clinical symptoms depend largely on the size of the stone, its location and whether it causes partial or complete obstruction in the urinary tract. Diagnostic imaging (X-ray and/or ultrasound) is required to establish the diagnosis and determine the localization of the stone. Depending on the sex of the animal affected and where the stone is located, as well as its size, possible non-invasive treatment and surgical intervention may be necessary.

In our study, we collected data on the patients we treat at the Clinic of the Department of Exotic Animal-, Wildlife-, Fish- and Honeybee Medicine of the University of Veterinary Medicine.

In our studies, we found that an average of 400 guinea pigs are treated at the departmental clinic annually. Of these, we managed to diagnose urolithiasis in 92 individuals during the period from 2020 to 2023, which was confirmed in 59% of males and 41% of females in terms of gender distribution. In terms of localization within the urinary tract, the stones were confirmed in the ureter in 34%, in the bladder in 39%, in the urethra in 27%. In females, urolithiasis was found in the bladder in 13 cases, while in males 23 times.

Overall, we found that urolithiasis occurs at a high rate in the patient material of our clinic. It was a more common problem in males and stones were often present in the bladder regardless of gender, but comparing the sexes, it is almost twice as common in males as in females.

Keywords: Guinea pig, urolithiasis, urinary calculi, diagnostic imaging

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Húgykövesség előfordulása tengeri malacokban

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A tengeri malacok egyik leggyakoribb megbetegedése a húgykövesség, melynek háttérében nagyon sokféle ok állhat. Általában a 2 évnél idősebb állatokban fordul elő. Irodalmi adatok szerint a húgykövek 90%-a calcium-carbonát összetételű. A húgykövek elhelyezkedése nagyon változatos, így a húgyutak bármely szakaszában megtalálhatók. A klinikai tünetek nagyban függenek a kő méretétől, az elhelyezkedésétől és attól, hogy okoz-e részleges vagy teljes obturációt a húgyutakban. A diagnózis felállításához és a kő lokalizációjának a meghatározásához képalkotó diagnosztikai (röntgen és/vagy ultrahang) vizsgálatra van szükség. Attól függően, hogy milyen nemű állat érintett és hol helyezkedik el a kő, illetve az mekkora, lehetséges non-invazív kezelés és műtéti beavatkozásra is szükség lehet.

Vizsgálatunkban az Állatorvostudományi Egyetem, Egzotikusállat-, Vad-, Hal- és Méhegészségügyi Tanszékének Klinikáján végeztünk adatgyűjtést az általunk ellátott beteganyagban.

A vizsgálatainkban azt találtuk, hogy a tanszéki klinikán átlagosan évente 400 tengerimalac kezelése folyik. Ezek közül a 2020-2023-ig tartó időszakban 92 egyedben sikerült húgykövességet diagnosztizálnunk, mely ivari megoszlását tekintve 59% hímekben és 41% nőstényekben volt igazolható. A húgyutakon belüli lokalizációt tekintve a kövek az ureterben 34%, a húgyhólyagban 39% és a húgycsőben 27% gyakorisággal voltak igazolhatók. A nőstényeknél 13 esetben, míg a hímeknél 23 alkalommal találtunk húgykövet a húgyhólyagban.

Összességében megállapítottuk, hogy a klinikánk beteg anyagában a húgykövesség magas arányban fordul elő. A hímekben gyakrabban okozott problémát és ivartól függetlenül a húgyhólyagban gyakran jelen voltak a kövek, de az ivarokat összevetve ez a hímeknél majdnem kétszer olyan gyakori, mint a nőstényekben.

Kulcsszavak: Tengeri malac, húgykövesség, húgykövek, diagnosztikai képalkotás

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Observations Concerning Myxomatosis in European Brown Hare

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According to our current knowledge, the *Leporipox* virus, which infects wild and domestic rabbits, did not cause disease in European brown hares, as they showed resistance to it. A few years ago, a new recombinant virus strain appeared in Western Europe, which was able to infect species of the genus *Lepus* and cause clinically significant disease.

The pathogen is spread by blood-sucking insects, primarily mosquitoes, and enters the body when they suck blood. After multiplying at the entry point, it replicates repeatedly in the internal organs, and then, due to its epitheliotropic affinity, its final multiplication takes place in the skin again. This leads to the appearance of clinical symptoms and pathological changes. Significant edema on the head causes swelling of the skin and inflammatory lesions on the eyelids, accompanied by edematous changes. Myxomatous nodules also develop around the mouth. Inflammation associated with nodule formation is less common on the ears than has been observed in previous epidemics in *Oryctolagus* sp. species. The genitals are also affected, with females developing edema, keratinization disorders and bucks developing severe edema in the skin of the scrotum. In the latter, acute serous-purulent inflammation attributable to secondary bacterial infections is quite common. In some cases, rhinitis may also occur in the nasal cavity as a result of secondary bacterial infection.

Histological examination reveals hyper- and parakeratosis in the epithelium, osmoregulation disorders in the epithelial cells (ballooning degeneration), and the appearance of myxoma cells in the dermis as a result of mesenchymal cell proliferation. In the latter, cytoplasmic inclusions can also be observed.

In Hungary, the first case was diagnosed on October 1, 2025, and a few weeks later, we received reports of the disease from central and southern counties.

After evaluating the hares arrived for postmortem examination, regardless of where they were sent from, we found that 85% of the individuals showing pathological changes were Strohnegative, while the remaining 15% were Strohnegative. Based on this preliminary finding, it appears that hares older than one year may be more susceptible to the pathogen. In contrast, we did not find any significant difference between the sexes in terms of disease susceptibility.

As we have very little data at our disposal, we are continuing our research and hope that by evaluating a larger sample stock, we will be able to answer the open questions (what happens to the population that has suffered the epidemic, to what extent can the stock regenerate, how long does it take for the population to recover, etc.).

Keywords: European brown hare, myxomatosis, pathology, vector-borne infection

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Mezei nyúl myxomatosisával kapcsolatos megfigyelések

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A mezei nyulakban eddigi ismereteink szerint az üregi- és a házi nyulat megbetegítő Leporipox vírus nem okozott betegséget, nála faji rezisztencia állt fen. Pár éve Nyugat-Európában megjelent egy új, rekombináns vírus törzs, ami már képes volt a *Lepus* nemzetség fajait is megfertőzni és klinikailag is megnyilvánuló kórképet kiváltani.

A kórokozó vérszívó rovarokkal, elsősorban szúnyogokkal terjed, azok vérszívása alkalmával jut a szervezetbe. A bemeneti kapuban történő szaporodás után a belső szervekben ismételt replikálódik, majd epitheliotrop jellege miatt végső szaporodása újra a bőrben zajlik le. Ennek nyomán jelennek meg a klinikai tünetek és egyben a kórjelző elváltozások is. A fejen jelentős vizenyő következtében a bőr duzzanata mellett, szemhéjon megjelennek a gyulladásos góccok, amit ödéma kísér. A száj körül is kialakulnak a myxomatosisos göbök. A füleken a göbképződéssel járó gyulladás kevésbé jellemző, mint azt az *Oryctolagus* sp. fajainál megfigyelhettük korábbi járványokban. A genitáliák is érintettek, ahol nőtényekben vizenyő és szarusodási zavar, bakokban súlyos fokú ödéma jelentkezik a tasak bőrén. Ez utóbbiaknál gyakori a másodlagos bakteriális fertőzésekre visszavezethető, heveny savós-gennyes jellegű gyulladás. Az esetek egy részében az orrüregben is jelentkezhet másodlagos bakteriális fertőzés nyomán rhinitis.

A szövettani vizsgálat alkalmával a hámban szarusodási zavar (hyper- és paraceratosis), a hámsejtek vízforgalmi zavara (ballonizáció elfajulás), míg az irharétegben a mesenchyma-sejtek proliferációja nyomán ún. myxomasejtek megjelenése a jellemző. Ez utóbbiakban citoplazma zárványok képződése is megfigyelhető.

Magyarországon az első esetet 2025. október 1.-én diagnosztizáltuk, majd pár hét elteltével már az ország középső és déli megyéiből is kaptunk adatokat a betegség megjelenéséről.

A boncolásra került nyulakat értékelve, függetlenül a beküldési helytől azt találtuk, hogy a kórbonctani elváltozásokat mutató egyedek 85%-a Stroh-jegy negatív, míg a maradék (15%) Stroh-jegy pozitív. Előzetesen ez alapján úgy tűnik, hogy az egy évesnél idősebb korosztály talán fogékonyabb lehet a kórokozóval szemben. Ezzel szemben az ivarok között nem tudtunk jelentős eltérést kimutatni a betegséggel való érzékenység tekintetében.

Mivel nagyon kevés adat áll a rendelkezésünkre, ezért a kutatást folytatjuk és reményeink szerint nagyobb mintaszámot értékelve a nyitott kérdésekre (mi történik a járványon átesett populációval, milyen mértékben tud az állomány regenerálódni, mennyi idő után áll helyre a populáció stb.) is választ kapunk.

Kulcsszavak: mezei nyúl, myxomatosis, kórbonctan, vektor terjesztette fertőzés

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Perception of the Rottweiler Breed in the General Population: An Analysis of Respondents’ Attitudes and Experiences

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For certain dog breeds, including Rottweilers, it is often said that they are aggressive or unpredictable. The aim of this study was to examine public attitudes and opinions regarding the Rottweiler breed in our region, and to assess the extent to which people rely on stereotypes or personal experiences.

The research was conducted via an online survey, which was completed by over 500 respondents from various age groups and social backgrounds. Among respondents, 30% considered Rottweilers to be an aggressive breed, while 55% reported a positive attitude toward the breed. Most respondents had previous encounters with adult Rottweilers, of which 10% were perceived as negative experiences. More than half of the respondents indicated that they are afraid of this breed. Under appropriate conditions, 52% would consider keeping a Rottweiler as a pet, but only 36% would hypothetically allow their child (aged 7–15 years) to play with one.

The results also show that 97% of respondents believe that a dog’s behavior largely depends on upbringing and socialization, and 49% consider Rottweilers to be intelligent and loyal to their owners. Timely socialization and proper training are crucial for all dog breeds, but larger breeds, such as Rottweilers, require additional attention and consistency. Lack of knowledge or irresponsible handling can lead to undesirable incidents and reinforce negative stereotypes.

In conclusion, while many respondents recognize the positive traits of Rottweilers, a substantial portion of the population still perceives this breed as aggressive and untrustworthy. The findings highlight the importance of public education, responsible ownership, and early socialization to promote safe and positive interactions with this breed.

Keywords: Rottweiler, breed perception, stereotypes, socialization, dog training

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Percepcija rase rotvajler u opštoj populaciji: analiza stavova i iskustava ispitanika

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Za određene rase pasa, uključujući rotvajlere, često se čuje da su agresivne ili nepredvidive. Cilj ovog istraživanja bio je da se ispituju stavovi i mišljenje društva u našoj regiji o rasi rotvajler i da se sagleda u kojoj meri se naši sugrađani oslanjaju na stereotipe ili lična iskustva.

Istraživanje je sprovedeno putem online upitnika, na koji je odgovorilo više od petsto ispitanika različitih starosnih grupa i socijalnog porekla. Od ispitanika, 30% je rotvajlere ocenilo kao agresivnu rasu, dok je 55% izrazilo da im se ova rasa dopada. Većina ispitanika imala je prethodna iskustva sa odraslim rotvajlerom, pri čemu je 10% tih susreta ocenilo kao negativno. Više od polovine ispitanika izjavilo je da se boji ove rase. Pod odgovarajućim uslovima, 52% bi razmotrilo držanje rotvajlera kao kućnog ljubimca, ali samo 36% bi hipotetički dozvolilo svom detetu (7–15 godina) da se igra sa njim.

Rezultati takođe pokazuju da 97% ispitanika smatra da ponašanje psa u velikoj meri zavisi od odgoja i socijalizacije, dok 49% veruje da su rotvajleri inteligentni i verni svojim vlasnicima. Pravovremena socijalizacija i adekvatna obuka ključni su za sve rase pasa, ali veće rase, poput rotvajlera, zahtevaju dodatnu pažnju i upornost. Neznanje i neodgovorno postupanje mogu dovesti do neželjenih situacija i jačanja negativnih stereotipa.

Iz ovog istraživanja može se zaključiti da, iako mnogi prepoznaju pozitivne osobine rotvajlera, značajan deo populacije još uvek ovu rasu smatra agresivnom i nepoverljivom. Rezultati naglašavaju važnost edukacije, odgovornog vlasništva i ranog započinjanja socijalizacije u cilju promovisanja sigurnih i pozitivnih interakcija sa ovom rasom.

Ključne reči: rotvajler, percepcija rase, stereotipi, socijalizacija, odgoj pasa

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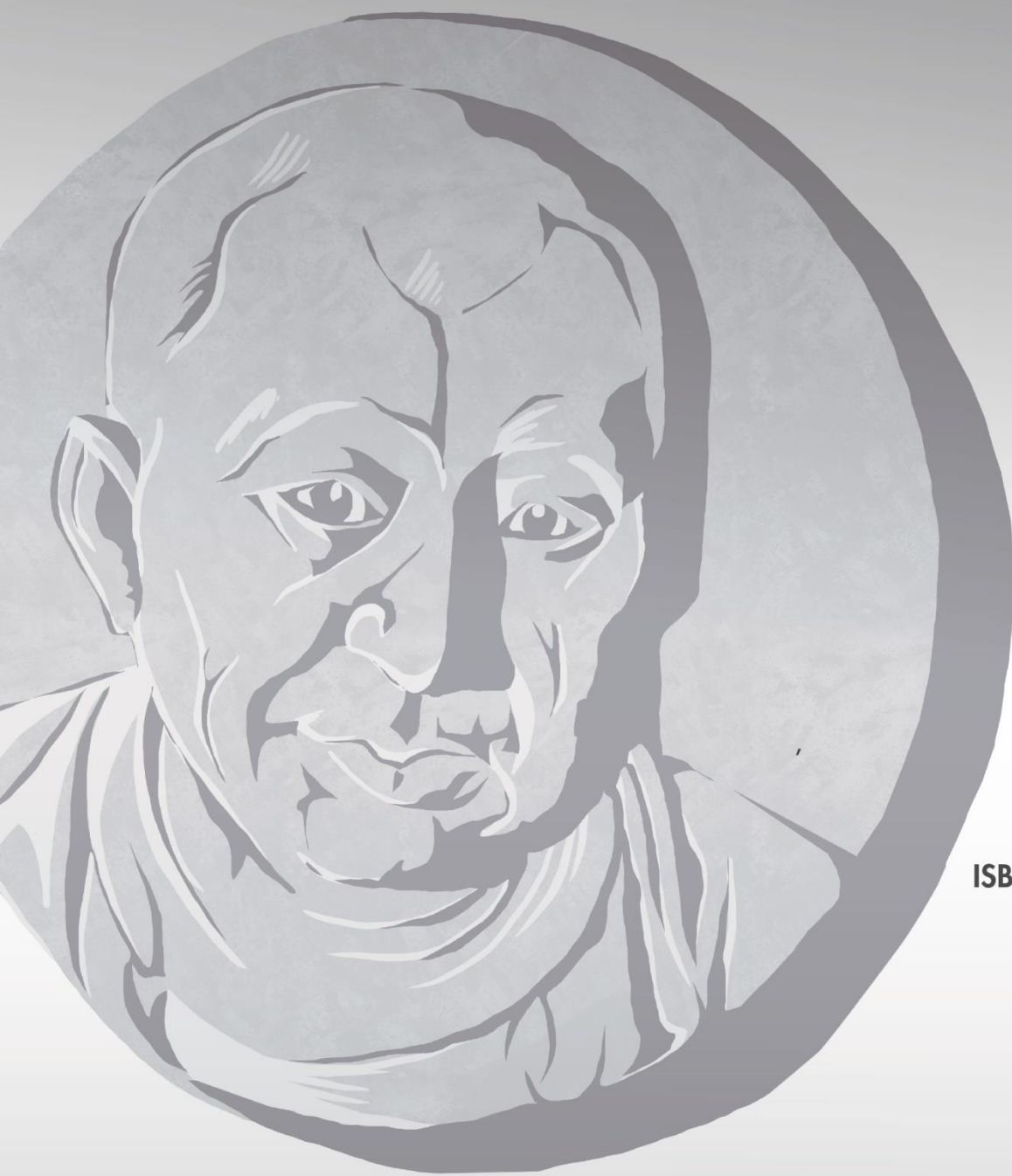


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