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ABSTRACT BOOK

BIOMEDICAL AND PRECLINICAL SCIENCES

O-01 Evaluation of UHF technology in transportation of cattle

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Introduction. Compulsory electronic tagging of cattle using ultra-high frequency (UHF) technology will be coming into force in Scotland in the near future. Ultra-high frequency technology offers many benefits over “traditional” low frequency including speed, accuracy, cost, read distance and the ability for multiple simultaneous readings. The aims of this study were to (i) determine the best combination/position of UHF antennae within a commercially relevant transportation vehicle and (ii) evaluate accuracy of UHF transponders during transportation from farm to abattoir.

Material and Methods. In total six UHF antennae (HD7-868 UHF RFID antenna, Mobile-Mark, Staffs, UK) were integrated into a newly fabricated livestock box. The livestock box consisted of three compartments, within the two front compartments UHF antennae were mounted to the ceiling (1 per compartment; Figure 1A). Antennae were mounted on the side wall in the rear compartment due to a retractable sheep deck, with three possible orientations (Figure 1B). Antennae were connected to a CAEN RFID Proton Reader (CAEN, Viareggio, Italy) and a Raspberry Pi 3, data (tag reads) were uploaded to the ScotEID database.



Fig 1. (A; LEFT) ceiling mounted (1) and (2) in front compartments and wall antennae (3) and (4). (B; RIGHT) wall antennae (1) fixed and (2) adjustable into 3 positions (a, b or c).

A UHF transponder was attached to the ear of each animal. Antenna logged transponders ~once per minute. This study was split into two phases (i) *Animal Loadings* (n=40) and (ii) *Transportation to Abattoir* (n=49). *Animal Loadings* – Combinations of antenna were assessed during 10 loadings and unloadings of cattle at each orientation (n=40 in total), location was also assessed using GPS. Note: initial issues with the technology meant accurate data was not recorded for all loadings (inaccurate/inconsistent date/time). Each loading consisted of a batch of 16 animals loaded onto the livestock box (5 or 6 animals in each com-

partment), cattle were held for ~5 minutes before releasing. Loadings were spread over a 3-month period to minimise stress. *Transportation to Abattoir* – Animals were monitored during transportation from SRUC’s Easter Howgate Farm to 2 abattoirs (3 transportations in total). Note: GPS was not installed during this stage. Read rates and accuracy of GPS was assessed where accurate data was recorded (e.g. accurate date/times), retention of tags were also assessed.

Results. Animal Loadings. Twenty-six loadings had accurate data. All tags were continuously read whilst animals were loaded giving a read rate of 100%. Accurate locations were recorded (GPS). All tags were retained and fully functional after 3-months. *Transportation to Abattoir.* Two loadings had accurate data, both had a read rate of 100% and were read continuously throughout the journey.

Conclusions. Exceptionally high read rates (100%) were noted regardless of antenna orientation, GPS also accurately recorded location of the livestock box.

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O-02 Detecting digital dermatitis in dairy cattle using infrared thermography

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Lameness in dairy cattle is a persistent problem. Lameness is associated with significant pain, poor animal welfare and a reduction in milk production. Digital dermatitis is a common cause of lameness. Thermal imaging is a technique that detects heat and inflammation in tissue, and has the potential for use in automated detection systems. Previous studies with thermal imaging have imaged either the heels or the coronary band of the foot and typically only used the maximum temperature (Max) value as the outcome measure. This study investigated the utility of other statistical descriptors: 90th percentile (90PCT), 95th percentile (95PCT), standard deviation (SD) and coefficient of variation (CoV) and compared the utility of imaging the heel or coronary band. Images were collected from lame and healthy cows using a high-resolution thermal camera. There were significant differences between lame and healthy feet detectable at the heels (95th percentile: $P < 0.05$; SD: $P < 0.05$) and coronary band (SD: $P < 0.05$). Within lame cows, 95PCT values were higher at the heel ($P < 0.05$) and Max values were higher at the coronary band ($P < 0.05$) in the lame foot compared to the healthy foot. It was concluded that the maximum temperature measure is the best measure to detect lameness, but that other measures can be used. Differentiation of lame from healthy feet was most apparent when imaging the heels.

O-03 Imaging anatomical and macrometric specifics of the adrenal glands of the chinchilla (*Chinchilla lanigera*)

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The aim was to investigate the imaging anatomical specifics of the adrenal glands in chinchilla. We used 12 chinchillas, aged 18 months in supine recumbency. Transverse, sagittal and dorsal contrast CT images and 3D reconstruction were obtained. Craniocaudal, dorsoventral and lateromedial diameters were measured. Coronal T1 MRI was performed. The transverse CT image demonstrated the right gland as hypo attenuated and elliptic, compared to the right kidney. The left gland was oval, in a distance to the abdominal aorta. LM diameter of the right gland was 3.97 ± 0.25 mm. LM diameter of the left gland was lower - 3.50 ± 0.18 mm. DV diameter of the right gland was 3.01 ± 0.11 mm. That of the left gland was 3.67 ± 0.15 mm. CrCc diameter of the right gland was 3.87 ± 0.21 mm; that of the left gland was 5.24 ± 0.08 mm. 3D coronal reformat image demonstrated the anatomical location of both glands. Dorsal T1 MRI images showed that both glands were retroperitoneal organs and with low signal.

O-04 Productive and biochemical parameters in lambs under the influence of the immunomodulator Immunobeta®

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To achieve this goal, an experiment was performed with 12 one-month-old lambs, breed Assaf, to whose diet we added immunomodulator Immunobeta® at a dose of 4 g / kg of feed for two months. The live weight of the animals and the consumption of feed were determined by measuring the weight, with an accuracy of 0.001 kg, every two weeks. At five months of age, after shearing the lambs, the weight of their raw fleece was determined. At the same age, blood samples were taken from the lambs for testing. Blood biochemical parameters (aspartamine aminotransferase (ASAT), alanine aminotransferase (ALAT), γ -glutamyl transpeptidase (GGT), cholesterol, glucose, total protein, total bilirubin, creatinine, uric acid) were determined in the Laboratory-Diagnostic Center - Clinical Laboratory at Trakia University - Stara Zagora, Bulgaria using an automatic biochemical ana-

lyzer. Statistical processing of the results was performed by one-way analysis of variance ANOVA with computer program GraphPad InStat 3.06, with a confidence level $P < 0.05$. After two months of treatment of the lambs with the immunomodulator, we recorded significantly higher values in experimental animals treated with Immunobeta® as a dietary supplement - live weight of the lambs ($P < 0.05$), weight of the raw fleece ($P < 0.05$) and blood concentrations of total protein ($P < 0.05$). Immunobeta® at a dose of 4 g / kg of feed has a positive effect after two months of treatment on live weight, raw fleece weight and serum concentrations of total protein in lambs in pasture rearing.

O-05 Development of an experimental model of diabetes type 2

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The aim of the present study was to develop an experimental model of diabetes type 2 in rats. A total of 70 male Wistar rats were used. The rats were divided into two groups – experimental group (diabetic rats; $n=35$) and control groups (healthy rats; $n=35$). After 4 weeks on a high-fat diet animals from experimental group were treated intraperitoneally with streptozotocin (STZ) at a dose of 35 mg/kg. After STZ treatment experimental animals continued the same high-fat diet and were monitored for a period of 10 days. Control animals did not receive STZ treatment and were fed a standard diet for the entire period of the experiment. Blood glucose, triglycerides, total cholesterol, LDL and HDL were measured in experimental rats in the following dynamics – initial level, after diet and on day 1, 3, 5 and 10 after STZ treatment. The same parameters were also measured in the control animals at the same time points. Somatometric parameters were measured in the two groups – initial level, after diet, day 5 and day 10 after STZ treatment. The stable hyperglycemia and the significantly increased levels of total cholesterol, triglycerides and LDL in the experimental group strongly suggest the development of a condition mimicking diabetes type 2.

O-06 Population pharmacokinetics of N-acetylcysteine in broiler chickens

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N-acetylcysteine (NAC) has pronounced mucolytic and antioxidant properties and it is used in the treatment of many lung diseases in both humans and animals. There are studies of NAC pharmacokinetics in humans and cats, but information in chickens is not available. The present study aims to characterize the pharmacokinetics of NAC administered in feed in healthy broiler chickens and in chickens infected with *Mycoplasma gallisepticum*. The study included 32 broilers divided into four groups treated with NAC at a dose rate of 100 mg/kg/day mixed with the feed for five days. The first group was consisted of healthy broilers (n=6), the second group of infected chickens (n=10). The third and fourth groups consisted of healthy broilers (n = 6) and infected chickens (n = 10) treated with NAC via feed and doxycycline at a dose rate of 20 mg/kg/day with drinking water. Plasma concentrations were determined by LC-MS/MS analysis. NAC was absorbed after oral administration in all four groups of chickens. A one-compartmental analysis was used to characterize the pharmacokinetics of orally administered NAC in healthy broilers. C_{max} of $2.26 \pm 0.91 \mu\text{g}\cdot\text{mL}^{-1}$ was detected at a T_{max} of 2.47 ± 0.45 hours. The absorption half-life value $t_{1/2ab} = 1.04 \pm 0.53$ h is lower than the elimination half-life $t_{1/2el} = 3.30 \pm 1.43$ h. The values of the elimination and absorption constants are as follows $k_{el} 0.21 \pm 0.09$ h⁻¹ and $k_{ab} 0.67 \pm 0.34$ h⁻¹. The area under the curve ($AUC_{0-\infty}$) has a value of 19.24 ± 4.25 h $\cdot\mu\text{g}\cdot\text{mL}^{-1}$. In addition, a population pharmacokinetic analysis was performed using recalculated doses received from each group of chickens. Overall, the data show that there is no significant difference in pharmacokinetics between healthy and *Mycoplasma gallisepticum*-infected broilers and that no dose adjustment of NAC is required. Co-administration of doxycycline did not cause changes in the pharmacokinetics of NAC.

O-07 Protein factors of capacitation and decapacitation in canine seminal plasma

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The aim of the present study is to determine the proteins in the canine seminal plasma that have a direct effect on specific sperm parameters during fertilization. The influence of seminal plasma proteins is focused on three processes: capacitation, hyperactivation and decapacitation. The size exclusion chromatographic fractional separation of proteins from seminal plasma based on their molecular weights was performed. In addition, twodimensional electrophoresis of several seminal protein fractions was

done. The effect of protein molecules on the motion and kinetic parameters of the male gametes in in vitro conditions was monitored by Computer-Assisted Sperm analysis. The difference of the enzyme activity in whole seminal plasma and each chromatography fraction was measured. The measurement was conducted spectrophotometrically using the BA-88A semi-automatic chemistry analyzer and was focused on the following enzymes: Lactate Dehydrogenase, Alkaline Phosphatase, Gamma-Glutamyl Transpeptidase, Creatine kinase and Alanine Transaminase. It has been determined that protein fractions with different molecular weights affect the motility and kinetic characteristics of sperm in vitro, leading to hyperactivation or initiating decapacitation changes in kinetics. The detailed study of the seminal plasma proteome would add fundamental information about the processes associated with the physiological changes occurring in the spermatozoa before fertilization. The seminal plasma proteins have a vast variety of actions, some of them well studied, others still unclear. The study of the canine seminal plasma proteome could add fundamental information about the processes occurring in the spermatozoa before fertilization in their direct connection with the protein molecules in it.

P-01 High selectivity of vitamin E prototype (alpha-tocopherol succinate) towards leukemia lymphocytes and its potential for nanomedicine-based cancer therapy

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The combined application of several anticancer agents with different modes of action is among the commonly used therapeutic practices in tumor treatment, because maximizing the apoptotic potential of the cell and overcoming drug resistance. Unfortunately, according to obtained results, the harmful side effects of the combined treatment on normal cells and tissues could not be avoided. The application of natural products, with redox modulating properties, which affect mitochondrial metabolism, could be used as a new line therapeutic approach. It is well known that α -tocopherol succinate (alpha-TS), an analog of vitamin E, produced by esterification with succinate acid, is a biological active lipophilic compound with redox modulatory properties. Recent studies have indicated its possibility to be used for the design of self-assembled carrier-assisted drug delivery systems. On the one hand, the potential of alpha-TS to be incorporated in polymer hydrophobic vesicular membrane, using a simply nano-engineering dialysis method, where multiple noncovalent interactions have been produced, has also been reported. On the other, various studies have demonstrated the selectivity of alpha-TS towards different types of cancer cell lines and induction of cancer cells death, but without an effect on normal cells. Studies report data on expressed antitumor activity of alpha-TS on several preclinical animal models, where the administration of alpha-TS was initiated by intraperitoneal or intravenous injection. A necessity of avoiding hydrolyzation of the bioactive molecules due to intestinal esterases activity was

outlined. The aim of the study was: i) to investigate the effect of different concentrations of alpha-TS on both leukemia and normal lymphocytes; ii) to define alpha-TS sensitizing ability against variety of anticancer drugs (conventional and new-generation) and to highlight synergistic cytotoxic effect(s). The obtained results indicated nontoxic effect of alpha-TS towards normal lymphocytes at concentrations up to 50 μ M and slight toxicity was obtained at concentrations up to 120 μ M. Compared to normal lymphocytes, the effect of the redox modulator to leukemia cancer cell line was excessively different and decreased cancer cell viability marked at time- and dose-dependent manner. The strong synergistic cytotoxic effect was detected, when alpha-TS was combined with two types of new generation anticancer drugs and antagonistic or additive effects were observed when redox modulator was combined with conventional anticancer drugs. These evidences stated a possibility to conduct a study on the applicability of alpha-TS for drug delivery systems of new-generation anticancer drugs.

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P-02 Structural characteristic of pig's ureterovesical junction

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We studied the morphological features of the porcine ureterovesical junction in regards of its clinical importance and well accepted suitability of domestic swine for medicobiological research with significance for man, including a xenotransplantation, as well. Pieces from the urinary bladder wall together with the intramural part of the ureter (at the level of trigonum) of six male, 6-month- old pigs slaughtered for meat consumption in accordance to Bulgarian laws, were collected. They were fixed immediately in Carnoy's liquid and 10% neutral buffered formalin, then were cleared and embedded in paraffin. Sections of 5 μ m were stained with 0.1 % toluidine blue in McIlvane's buffer, pH 3 and hematoxylin-eosin. Our light microscopic observation showed that the urothelium of both ureter and bladder was with the same structure. Well defined lamina propria was situated between the basement membrane of the urothelium and muscular tunic. Lamina muscularis of mucosa was not observed. The muscular tunic of the intramural part of ureter consists of three layers transmitting in the muscular bundles of the bladder without visible border. No clear adventitial layer of the ureteral wall was detected. At that level mast cells with different location and distribution were found. The metachromatic cells were observed in the lamina propria and between the muscular bundles. The blood vessels were presented mostly by capillaries, arterioles and venules. The caliber of the latter was two – three time more than those of arterioles. The obtained original data give new and useful information which would add the knowledge for that so important part of porcine urinary organs.

P-03 A corrosion casting study and histology on the blood vascular system of Black Sea Turbot (*Psetta maxima*)

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Turbot (*Psetta maxima*) is the most valuable and economically important species for the Black Sea countries. The purpose of the current study was to describe and visualize the cardiovascular system of this species with corrosion cast study method. For this aim, 6 turbot (3 males and 3 females) were obtained from sea hauls. After that fish were sacrificed and the blood vessels were filled through the heart with self-curing castable resin Duracryl[®] Plus O. Apart, materials from aortae for histopathology examination were taken and fixed in 10% neutral formalin solution. Based on the corrosion cast and histological techniques we described structure of the vascular pathways.

P-04 Revision of the classical tarsal osteoanatomy in a horse: A case of separate os tarsale primum

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Introduction. The tarsal area of the horse is a challenge for anatomical imaging and diagnostic interpretation of the findings, due to its complexity. In this regard, in-depth knowledge of tarsal osteoanatomy is of paramount importance and is a prerequisite for accurate diagnosis as well as for the choice of clinical approach (Vanderperren et al., 2009; Schumacher & Wilhite, 2012). Some classical anatomical data indicate a reduction in the total number of the tarsal bones (*ossa tarsi*) in the horse due to the fusion of *os tarsale I* (tI) and *os tarsale II* (tII) from the distal tarsal row (Gigov & Gadev, 1985; König & Liebich, 2004; Kovachev et al., 2017). Gadzhev (2000) points to a common, irregularly shaped bone (*os cuneiforme mediointermedium*), the result of the fusion of os tI and os tII. Other authors describe a definite fusion of the two bones from the tarsal joints in a horse (Raes et al., 2011), while Taylor (1977) points to variability in the anatomical relationship between os tI and os tII, expressed in fusion or separate presentation. The focus of the present study is to revise what is known in classical anatomical sources by anatomical and radiographic study of *os tarsale I* in horses.

Material and methods. Twelve anatomical cuts of tarsal joint of a horse, obtained to ensure the education process in the Department of Veterinary Anatomy, Histology and Embryology were studied anatomically and subjected to subsequent radiographic study.

Results. Eleven anatomical cuts of tarsal joint show complete fusion of os tI et II resulting in a single (common) bone with variable shape. One of the studied cases demonstrates a separate os tI, with sharp formation of normoanatomical facets on the bone for joint connection with the adjacent os tII and *os tarsi centrale*.

Conclusion. Contrary to what is commonly known, the skeleton of the tarsal joint in the horse shows variability in the anatomical relationships between *os tarsale I* and *os tarsale II*, which should be taken into account either in students' education, either in the clinical practice.

P-05 Age histometric study on the wall of proventriculus gastris in the domestic canary bird (*Serinus canaria*)

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During the postnatal growth of birds, changes occur in the size of some proventricular structures, such as the height of the deep glands, the thickness of the wall, and the layers that make it up. The wall of *proventriculus gastris* in the domestic canary bird (*Serinus canaria*) has a four-layer histological structure. The lack of specific data from an age-related histometric investigation of the wall of *pars glandularis* in the domestic canary bird provoked us to perform the present study. Histological sections obtained from the wall of *proventriculus gastris* of 24 domestic canaries, age divided into 4 groups (2nd, 8th, 30th day, and 2 years), each of which contains 6 birds were studied. Data analysis of the micrometric measurements were performed using *Multivariate ANOVA*, and *Post hoc* with *LSD test*. The values of the total thickness of the proventricular wall and the height of *gll. proventriculares profundae* increase significantly ($p < 0.05$) in all age groups. The change of the values of the internal longitudinal and the middle circular muscle layer increase till 8th day after hatching with subsequent regression till 2nd year of age. The measured values of the external longitudinal muscle layer and the serosa do not demonstrate comparative differences ($p > 0.05$) between the age groups. In conclusion, we could explain that the most dynamic changes are found for the measured values of the internal longitudinal and the middle circular muscle layer.

CLINICAL SCIENCES

PL-04 Our step-by-step approach to feline gingivitis

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Dentovet, USAMV Cluj-napoca, Dentoralmax

Introduction. Feline gingivitis is a pathologic condition commonly encountered in everyday practice. Feline gingivitis may stand alone or may be a clinical sign in a complex context of stomatitis. Feline stomatitis may appear on a patient with no associated medical problems or in a complex context of Feline Calicivirus, FIV or FeLV.

Materials and methods. The first step in approaching feline gingivitis is to establish a precise diagnosis. Everything starts with setting the exact age. If the patient is between six, seven months and one year, we keep a close eye on it. This is because transitory gingivitis due to dental eruption is commonly encountered. Every patient with gingivitis is FIV, FeLV tested to establish if the gingivitis stands alone or accompanies other pathological entities. If positive, first of all, we sustain patient immunity, and most likely, the gingivitis improves without any particular interventions. If negative, we continue our research in establishing a correct diagnosis. Is gingivitis standing alone or in a complex context of stomatitis—one way or another, we recommend dental X-rays. Dental X-rays are imperious when dealing with gingivitis. They may reveal dental or bone resorption or not. Understanding the radiological signs of dental pathologies will select the appropriate treatment.

Results. We have introduced this protocol in our clinic for about two years. The speciality literature indicates a small number of patients that do not respond to any treatment. Our percentage is 0,004, meaning two cats in 500 cases requiring more than full mouth extractions. We didn't have to euthanise any of our patients because of the lack of response to our treatments.

Conclusions. Precise diagnosis leads to a precise treatment plan. Pathological entities like feline tooth resorption, periodontal disease are accompanied by gingivitis. Therefore, the clinician has to identify the source of gingivitis to have predictable success.

O-09 Long-term clinical and goniometric follow-up of lateral suture surgery in dogs with cranial cruciate ligament rupture

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The aim of this study is to evaluate the complications and the short-, medium-, and long-term outcomes following treatment of cranial cruciate ligament (CCL) rupture in dogs using the lateral fabello-tibial suture technique. The patients were ten dogs of various breeds, 62.5 ± 18.8 months of age, weighing 30.2 ± 3.3 kg, with unilateral CCL rupture. At 2, 6,

12, 24, and 52 weeks after surgery, the dogs were re-evaluated with clinical examination, gait and pain analysis, and radiography. A major complication was identified in one dog (10%), requiring second surgery due to implant failure and destabilization of stifle joint. Minor complications occurred in two dogs postoperatively (one late meniscal injury and one case of seroma formation). The short-term outcome at two and six weeks postoperatively was considered good in six dogs and satisfactory in four dogs, while the mid-term outcome (between 12 and 24 weeks) was good to excellent in eight dogs and satisfactory in two dog. All ten dogs had a good to excellent outcome 52 weeks after surgery. The lateral suture technique is generally safe and given the major benefits, such as lower costs, lower technical difficulty, and minimal requirement for specialized equipment, it is likely that will remain a popular and alternative for treatment of CCL insufficiency in dogs with good degree of owner satisfaction.

О-10 Сравнителни проучвания между локалното и общо приложение на еритропоетин за стимулиране костната регенерация на калвариални дефекти при плъхове

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Освен физиологична роля при контрола на хемопоезата, през последните години е установено, че еритропоетинът (ЕПО) притежава редица допълнителни функции в организма на животните и човека. Сведения за неговия остеогенен и ангиогенен потенциал провокират интереса на изследователите, разработващи нови стратегии за стимулиране на костната регенерация. Целта на проведеното проучване е да се сравни ефекта от локалното и общо приложение на рекомбинантен човешки еритропоетин (rhEPO) върху костното зарастване на калвариални дефекти при плъхове. Използвани са 24 броя плъхове, породна линия Вистар, мъжки пол, завършили скелетния си растеж. В калвариалните кости на всяко от животното са създадени по два костни дефекта с критичен размер от 5мм. При плъховете от първа опитна група, в левите дефекти е приложен ЕПО локално върху колагенов носител, а в десните – колагенов конус, напоен с физиологичен разтвор. Животните от втората опитна група са инжектирани еднократно интраперитонеално с ЕПО в доза 4 900 IU/kg, като в левите дефекти е поставен само конус, а десните са оставени празни. Общият ефект от третирането с еритропоетин върху организма е доказан чрез морфологични изследвания на кръвта на 0, 30-ти и 90-ти ден. Процесът на костно зарастване е проследен чрез рентгенографски и компютърно-томографски изследвания през същите интервали. Получените резултати показват, че локално приложение на ЕПО, за разлика от системното, не повлиява статистически значимо хемопоезата, но същевременно води до образуването на нова костна тъкан и с успех може да се ползва като средство, стимулиращо костната регенерация.

O-11 Evaluation of trochlear dysplasia in dogs with medial patellar luxation – comparative radiographic studies

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The aim of the present study was to evaluate the depth and shape of femoral trochlear groove on radiographs obtained from healthy dogs and dogs affected with grade II and grade III medial patellar luxation (MPL). A total of 45 dogs (33 with MPL and 12 healthy) from four small breeds (Mini-Pinscher, Pomeranian, Chihuahua and Yorkshire terrier) were included in the study. Seven morphometric parameters associated with the onset of trochlear dysplasia similar to those used in human medicine were measured: trochlear sulcus angle, lateral and medial trochlear inclination, trochlear groove depth, patellar thickness and the ratio between trochlear depth and patellar thickness. In studied stifle joints, altered trochlear shape and depth were found out, more pronounced in joints with grade III MPL. Sulcus angle was higher along with considerably reduced trochlear depth, medial trochlear inclination and trochlear depth/patellar thickness ratio.

O-12 Pregnancy rates associated with oxidative stress after Pre-synch/Ovsynch synchronization of Bulgarian Murrah buffaloes during breeding and non-breeding season

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The objective of the current study is to measure the effect of oxidative stress on pregnancy rates of Bulgarian Murrah buffaloes during breeding and non-breeding season. The study group consisted of 24 mature buffaloes more than 40 days after parturition. The Pre-synch/Ovsynch protocol was used for estrus synchronization. The following parameters were measured: Reactive Oxygen Species (ROS) products, Ascorbate radicals, Malondialdehyde (MDA), Nitric Oxide (NO), Super Oxide Dismutase (SOD), Glutathione peroxidase (GSH-Px), Protein Carbonyl Content (PPC), and total Nitric oxide. A statistically significant increase in ROS products was measured in blood serum during the breeding season compared with non-breeding season. High levels of oxidative stress were registered due to low SOD activity in buffaloes during the breeding season compared to SOD activity during the non-breeding season. The highest activity was observed in non-pregnant buffaloes during the summer season. There were no statistically significant differences in MDA levels during both seasons. The highest measured concentrations were in pregnant buffaloes during the breeding season. The lowest GSH-Px levels were observed in non-pregnant buffaloes during both study periods. During the breeding season concentrations of total NO and

PPC were elevated. The highest levels measured were in non-pregnant buffaloes during the breeding season.

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O-13 Seasonal changes in oxidative stress and antioxidant activity of dairy cows during the transition period and the effect on fertility

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The objective of the current study was to measure the concentrations of oxidative stress and antioxidative activity of Malondialdehyde (MDA), Glutathione peroxidase (GSH-Px), Super Oxide Dismutase (SOD), Protein Carbonyl Content (PPC) in dairy cows (n=48) during the transition period depending on calving season and its effect upon basic reproductive parameters. A statistically significant increase ($P < 0.05$) of reactive oxygen species (ROS) products was observed in blood serum on Day 0 and Day 15 after calving during the winter season and on Day 45 after calving during the summer season. The concentrations of Ascorbate radicals (Asc. radicals) and Nitric Oxide (NO) in the winter season was high throughout the duration of the study ($P < 0.05$). MDA activity gradually increased to the day of calving and then decreased in the puerperal period for both study groups. Statistically valid ($P < 0.05$) concentrations are significantly higher during summer. GSH-Px concentrations are low on Day 0 of calving and mark a gradual increase during puerperium in both seasons. They were significantly higher in the winter season ($P < 0.05$). The levels of SOD in the summer period and PPC in the winter season were marginally higher. Cows calved in the summer months registered with a longer interval between calving and conception, higher insemination and higher fertility rate than those calved in winter.

Acknowledgements. The research that led to these results was funded by the National Research Program "Reproductive Biotechnologies in Animal Husbandry in Bulgaria (NRP REPROBIOTECH)" № 0406-105 of the Ministry of Education and Science of Republic of Bulgaria.

O-14 Use of ELISA tests to detect pregnancy associated glycoproteins (PAGs) in serum and milk in lactating cows

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The objective of this experiment was to determine the efficiency of commercial test Ruminant PAG ELISA for early pregnancy diagnosis using the circulating pregnancy associated glycoproteins (PAGs) in blood serum and milk. The study group consisted of 144 Holstein-Friesian dairy cows. On Day 30 of artificial insemination, blood and milk samples were collected. The pregnancy was confirmed 15 days after sample collection by transrectal ultrasonography. The concentrations of PAGs in serum and milk samples were measured using commercial tests Ruminant Pregnancy PAG ELISA. The resulting data was processed by a computer statistics program StatSoft (Statistica 7, Microsoft Corp. 1984-2000 Inc.), using a nonparametric test for differences in proportions. Serum PAGs concentrations are significantly higher than milk PAGs concentrations ($P > 0.05$). Regarding pregnancy diagnosis, the sensitivity, specificity, and accuracy are acceptable for both sample types, despite that more accurate were the results of the serum PAGs ELISA test.

Acknowledgements. The research that led to these results was funded by the National Research Program "Reproductive Biotechnologies in Animal Husbandry in Bulgaria (NRP REPROBIOTECH)" № 0406-105 of the Ministry of Education and Science of Republic of Bulgaria.

O-15 Clinical, paraclinical and endoscopic studies in horses with inflammation of the lower respiratory tract

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Clinical and paraclinical studies were performed in 24 horses aged 3 to 20 years with pathology in the lower respiratory tract. All animals had frequent and difficult breathing as well as a spontaneous cough. No changes in body temperature were found in 19 horses. Leukocytosis with neutrophilia was found in 6 of the animals. All horses underwent endoscopic examination of the airways and bronchoalveolar lavage. All horses had mucus in the trachea in varying amounts, ranging from small single flocs to streams occupying one-third of the lumen. In the microbiological testing of samples of the lavage are isolated representatives of *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Rhodococcus equi*, *Providencia* spp.

O-16 Plasma cholesterol and triglyceride levels in Black-necked pheasants with cannibalism treated with silymarin and tryptophan

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In the study, 48 blood samples were taken from Black-necked pheasants, divided into 4 groups: first group - clinically healthy, second group - birds treated with tryptophan, third group- birds treated with silymarin, fourth group - birds with signs of cannibalism (n=12 by group, n=6 by sex). The investigated plasma biochemical parameters were cholesterol and triglyceride. Significantly lower levels of cholesterol ($p<0.001$) were found in the first group (2.82 ± 0.45), unlike the second (4.52 ± 0.91), third (6.71 ± 1.22) and fourth (3.65 ± 0.41) one. Highest levels of cholesterol were found in both male (6.68 ± 1.18) and female (6.72 ± 1.37) pheasants in the third group ($p<0.001$). The levels triglycerides ($p<0.001$) were significantly higher in the first (2.64 ± 1.26) group of the pheasants in comparison to the second (1.11 ± 0.36) and fourth (0.74 ± 0.28) group. Higher levels of the triglycerides were also found in the third (2.36 ± 0.82) group in comparison to the second and fourth group ($p<0.01$). The pheasants which were treated with silymarin supplements had significantly higher levels of the analyzed biochemical markers.

O-17 The frequency of liver lesions of sheep slaughtered in Tirana abattoir

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Liver pathologies occupy an important place in the range of veterinary issues important to the health of flocks and herds affecting production decline and to shorten the productive life of animals. Study in sheep liver pathological processes in Albania, related to different aspects; a number of processes have poor clinical expression; some of them related to pathogens and parasitic, viral or bacterial; others are based metabolic, etc.. Clarification of these aspects would be a concrete aid for veterinary practice in combating liver pathologies. The study was carried out in Tirana. The sheep examination in slaughterhouses was randomly and animals had different age and origin. In 91 samples (40.6 %) macroscopic changes have been verified, while 133 samples (59.4 %) have not shown any macroscopic changes. Necrosis occupies higher frequency (17.91 % of pathological processes in the liver). We found that in 3 forms; centrolobular necrosis (40.48 %); periportal necrosis (34.52 %) and massive necrosis (25 %). Gravity of fibrosis in the total number of pathological processes (469) amounts to 17.27 %, and in animals with lesions was present in 81 samples (89.01 %). Changes in bile ducts occupy third place in the frequency of pathological processes with 13.43 %, while these changes are met in 63 samples of sheep

(69.23 %). Diaphragmatic adhesion (9.17 %) was found in 43 sheep (47.25 %), cholangiohepatitis (10.67 %) was found in 50 sheep (54.94 %) and atrophia (8.32 %) was found out in 39 sheep (42.85 %).

O-18 Histopathologic and electron microscopic studies on porcine proliferative ileitis

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The aim of the study was to investigate some morphological characteristics of ileal lesions essential to porcine proliferative enteropathy (PPE). Gross investigations of ileal lesions were performed in fattened pigs (n=1068) at slaughter from different regions in Bulgaria. Transverse sections from terminal ileum (n = 127) were collected and processed routinely for histology (HE). Warthin-Starry silver stain (WS), immunohistochemical (IHC), (mAb-Law1DK), light and transmission electron microscopy were applied. The incidence of lesions was high in the pooled samples (48.03 %). Grossly, the lesions were consistent with regional ileitis (47.06 %) and porcine intestinal adenomatosis (52.94 %). Histopathologically, presence of distinct proliferation was seen in most samples (92.13%). WS revealed intracellular microorganisms in 76.38 % of PPE lesions. High prevalence of IHC was also observed (81%). Ultrastructurally, immature epithelium contained copious apical intracytoplasmic bacteria compatible with *L. intracellularis*. Diagnostic test correlation to IHC results, revealed relation of agreement in comparison to only gross examination, fair for HE and poor for WS.

P-6 Semen improvement in oligozoospermic dogs after treatment with Speman®

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The aim of the present investigation was to evaluate the effect of Speman®, a well-known ayurvedic proprietary preparation, in male dogs suffering from infertility associated with oligozoospermia. 23 dogs were diagnosed by semen evaluation with oligozoospermia and a treatment with Speman® was prescribed for a period of 180 days. During this period, three control semen evaluations with an interval of 60 days were made. No adverse effects were reported. Semen volume, concentration, total number of sperms per ejaculation, viability, motility and percentage of morphology normal spermatozoa significantly increased (p<0.05) in all of the treated dogs. As a formulation of plant origin, Speman® may successfully improve the sperm quality in infertile male dogs due to oligozoospermia.

P-7 Effect of different cryoprotectants, equilibration time and warming procedures on canine sperm motility and viability after vitrification using coconut water based extender

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The aim of the present investigation was to evaluate the effect of different cryoprotectants, equilibration time and warming procedures on canine sperm motility and viability after vitrification using coconut water based extender. Ten ejaculates were collected separately by digital manipulation from 10 adult dogs. Only the second fraction of the ejaculate was used in this study. It was evaluated macroscopically and microscopically, divided into two aliquots and diluted with 2 types of coconut water based extender until final concentration of 200×10^6 spermatozoa/ml. Base vitrification media (BVM) was prepared using 50% (v/v) coconut water, 25% (v/v) distilled water, 25% (v/v) 5% anhydrous monosodium citrate solution. Extender A consisted of BVM with addition of soy lecithin and fructose at 1% and 0.25 M sucrose and Extender B consisted of BVM with 20% (v/v) egg yolk and 1% fructose. Both of the samples were divided into three aliquots and each of them was equilibrated at different regimens: room temperature (E0), 5°C for 30 minutes (E30) and 5°C for 60 minutes (E60) and then vitrified by dropping 33 µl of sperm suspension directly into liquid nitrogen. Sperm pellets were devitrified at least one week later and warming was done at 37°C or 42°C for 2 minutes. Motility was estimated using a microscopic digital system and viability was assessed by supravital staining technique. In conclusion, our results demonstrate that when vitrification and coconut water based extender were used, egg yolk as a cryoprotectant, presence of equilibration time of 60 minutes and warming at 42°C for 2 minutes returned the best sperm quality variables.

P-8 Chondrosarcoma in a dog – a clinical case

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The chondrosarcomas are malignant tumours in which the neoplastic cells produced chondroid and fibrillary matrix, but not osteoid tissue. The neoplasms are most common in dogs, in which they account about 10% of primary bone tumors. Tumours rank second in frequency after osteosarcomas of the bones. Chondrosarcomas affect most common medium and large dog breeds (Boxer, German Shepherd, Golden Retriever) and are relatively rare in small and giant breeds. Animals aged 5.9 to 8.7 years are usually affected. The tumours are slow-growing and metastasize hematogenously affecting most commonly the lungs, but there is evidence of distant metastases (kidney, liver, heart, skeleton). This case describes the clinical, radiological, macroscopic and histopathologic features of chondrosarcoma in a dog.

P-9 Ретроспективно проучване върху разпространението на фрактурите на дълги тръбести кости при котки

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Ортопедичните заболявания са актуален проблем при животните за компания. Счупванията на кости при котки представляват 1,1% от всички клиничните случаи в практиката. Целта на настоящото проучване е да изследва популацията от котки с фрактури на дълги тръбести кости в България, да анализира сезонното им проявление, както и тяхната полова, породна и възрастова принадлежност. В проведеното ретроспективно проучване са включени 267 котки с фрактури на дългите тръбести кости, пациенти на Клиниката за дребни животни на Ветеринарномедицински факултет, Тракийски университет, Стара Загора за периода 2016-2020 година. Пациентите са разпределени в две възрастови категории – подрастващи (до 18 месечна възраст) и скелетно зрели (над 18 месечна възраст), и в четири категории според телесната маса - до 2 кг; 2-4 кг; 4-6 кг и над 6 кг. Проследено е и сезонно проявление на различните видове фрактури. Получените резултати посочват, че най-голям брой фрактури на тръбести кости при котки се наблюдават през летните месеци на годината. Предимно засегнати са подрастващи котки от мъжки пол, с телесно тегло над 2 кг. Най-често настъпват счупвания на бедрената кост, следвани от тибията, радиус/улна и на последно място раменната кост.

P-10 Репродуктивни и биометрични показатели при дзвизки подложени на синхронизация на еструса с наличие или отсъствие на последващо GnRH третиране

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Проучването имаше за цел да се определят някои репродуктивни и биометрични параметри при дзвизки, подложени на синхронизация на еструса, последвано или не от GnRH третиране на ден четвърти след осеменяване. Изследването беше проведено с 24 животни от породата Източно Фризийска овца през неразмножителен сезон. Всички дзвизки бяха синхронизирани чрез интравагинални тампони, престояващи във влагалището за 12 дни и инжектиране на 500 UI PMSG в деня на изваждането. Извършено беше контролирано осеменяване от фертилни кочове между 52 и 60 часа след това. Животните бяха разделени на група I (n = 13, контролна) и II (n = 11; третирани с GnRH). Група II беше инжектирана с 50 µg GnRH на ден четвърти след осеменяване. Ултразвуково изследване на бременност беше проведено на 20, 25 и 35 ден след осеменяване, като се определяше брой на ембрионите при бременните овце и биометричните показатели размер на ембриона (PE) и диаметър на маточния лумен

(ДМЛ). Отчетени бяха репродуктивните параметри стойност на бременността (СБ), животни с едноплодна (ЕБ) и многоплодна бременност (МБ) и частична късна ембрионална смърт (ЧКЕС). Данните бяха статистически обработени чрез компютърна програма. Регистрирана беше ясна тенденция към повишаване на СБ при GnRH третираните овце (90.9% срещу 61.5%; $P < 0.058$), докато тези за ЕБ, МБ, и ЧКЕС за двете синхронизирани групи (25% срещу 20%; 75% срещу 80% и 37,5% срещу 30%) бяха близки. Средните стойности за РЕ и ДМЛ между двете групи и между овцете с или без ЧКЕС корелираха положително с дните на бременността ($P < 0.05$), но достоверни разлики между тях не бяха доказани. В заключение, третирането с GnRH на ден четвърти след осеменяването има положителен ефект върху стойността на бременността. Частична късна ембрионална смърт може да бъде наблюдавана между 20 и 25 ден от бременността с незначителен ефект върху размера на РЕ и ДМЛ. Дните на бременността корелират положително ($P < 0.05$) с измерените биометрични показатели. Бъдещите експерименти с голям брой животни ще дадат допълнителна информация за изследваните параметри.

P-11 Alfaprostol effectively induces estrus in cycling Bulgarian donkeys during breeding season

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Worldwide donkey is a species which is threatened of extinction. In order to be saved and improved different donkey breeds require optimization of the reproductive process. The aim of the present study was to investigate the effectiveness of synthetic prostaglandin ($PGF_{2\alpha}$) for estrus induction in cycling Bulgarian donkeys during breeding season. The study was conducted from February to July 2020 with six Bulgarian local breed jennies. The ovarian activity was monitored daily by trans-rectal ultrasonography and 20 cycles (3 cycles in four and 4 cycles in two donkeys) were tracked. On the 7th day after detected ovulation each animal was injected with 3 mg alfaprostol intramuscularly. Immediately before and for the next seven days after the treatment blood samples for P4 analysis were collected. Clinical observation for side effects up to two hours after drug administration was applied. Signs of behavioral estrus were registered daily by fertile donkey jackass. Ovarian dynamics and post-treatment ovulation were detected ultrasonographically. Statistical analysis was performed by ANOVA. None of the treated jennies showed any signs of depression, restlessness, and abdominal pain. Blood P4 levels significantly ($p < 0.01$) decreased (34.3 ± 12.8 vs. 5.7 ± 1.8 ng/ml) within 24 hours after drug application. All animals exhibited behavioral estrus and ovulation on the 5.8 ± 0.7 and 9.8 ± 1.6 days after the treatment respectively. Mean diameter of post-treatment ovulation follicle was 3.75 ± 0.43 cm. Our findings indicate that synthetic analog of $PGF_{2\alpha}$ alfaprostol could be used successfully to induce estrus and ovulation in Bulgarian local breed donkey. Research was supported by NSP-REPROBIOTEH, MES, Bulgaria.

P-12 Динамика на хематологични промени при куче след ухапване от змия. Клиничен случай

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Касае се за куче порода Лагото, на възраст 3 години и 5 месеца, постъпило за лечение в Университетската болница към ТрУ, със следните клинични признаци – саливация, полипноие, тахикардия, хематурия, с оток и силна болезненост в областта на заден десен крайник. Кръвните изследвания показваха значителни отклонения в редица показатели (Hb - 64 g/L, Eг – 2.23 T/L, Hct – 18.6 %, Leu – 57.04 G/L, ASAT - 701 U/L, ALAT – 188 U/L, ALP - 227 U/L, TBIL – 17.1 µmol/L). Въз основа на анамнезата, клиничното и параклинично изследване пациентът беше диагностициран за ухапване от змия. След проведената в продължение на 10 дни терапия с флуидни разтвори, кортикостероиди, общоукрепващи средства и антибиотици, настъпи клинично подобрение на животното, както и подобрение на хематологичните параметри. Представения от нас случай показва, че при навременна и адекватна терапия при ухапванията от змии могат да бъдат успешно подобрени редица хематологични и клинични показатели дори и без използването на хиперимунен противозмийски серум.

P-13 Карцином на стомаха при котка – клиничен случай

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Стомашните аденокарциноми се срещат изключително рядко при котките. Според някои проучвания са установени породни предизпозиции при Сиамките, а според други такива не се наблюдават. В специализираната литература са описани само няколко случая на аденокарцином на стомаха при котки, което представлява около 1 % от гастроинтестиналните аденокарциноми при този животински вид. Настоящото съобщение описва клиничен случай на аденокарцином на стомаха при котка. Отразени са клиниката, морфологията и биохимията на кръвта, ултразвуковото изследване и патохистологичната находка. Това е първият описан случай на стомашен карцином на котка в България.

P-14 Fibrosis, hematological and biochemical parameters in liver sheep

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Liver fibrosis remains a major health problem as fibrotic liver diseases have a high mortality rate and predispose to liver dysfunction, portal hypertension, and hepatocellular carcinoma (Schuppan D, 2008). Although intensive research over the past 20 years has led to significant improvements in understanding the pathogenesis of liver fibrosis, effective anti-fibrotic therapies are still lacking. If detected early, liver fibrosis may be curable or reversible. Histopathological examination may determine the presence of fibrosis but the difficulty and still further inaccuracy of diagnosis lies in obtaining the sample as the appropriate sample is not always obtained in the biopsy. Orientation but non-diagnostic tests to determine fibrosis may include analysis of liver enzymes with the advantage of ease of realization as well as very low cost compared to histopathological analysis. High enzyme levels which may orient around liver fibrosis may include AST, ALP and LDH.

P-15 A correlation between the fine needle aspiration biopsy and routine pathohistological investigation in the diagnostic of feline spontaneous mammary gland tumours

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In the present study a correlation between the fine needle aspiration biopsy and routine pathohistological investigation was performed in spontaneous feline mammary gland tumours. Of the investigated 120 neoplastic formations, the cytological diagnosis was correctly performed in 111 of them (92.5%), and in 9 of the patients surveyed (7.5%) the cytological diagnosis was incorrect. Three false positive results (2.5%) and 6 (5%) false negative results were found from the total number of tumors tested. In benign neoplasms, the cytological diagnosis was correctly in 17 tumors (94.44%). Only one false negative diagnosis (5.56%) was found of the total number of benign tumors. Of the investigated malignant neoplasms, the cytological diagnosis was correctly performed in 94 of them (92.15 %), and in 8 of the patients surveyed (7.88 %) the cytological diagnosis was incorrect.

P-16 Histopathologic and morphometric evaluations on porcine proliferative ileitis

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The aim of the current study was to develop a semi-quantitative and morphometric assessment of spontaneous lesions associated with the most common forms of porcine proliferative enteropathy (PPE). Thus, three experimental groups of ileal samples were selected featuring respectively: 1) intestinal adenomatosis, 2) regional ileitis and 3) ilea without morphological alterations. The groups were compared by point system according to the main diagnostic histological criteria in a semi-quantitative manner. The analysis revealed significant statistical differences in the formation of crypt abscesses, the amount of inflammatory cellular infiltrate, reduction in the number of cup cells, hyperplasia and distribution of crypts, intestinal villi shortening and total points of assessment. A variety of direct and indirect measurements were applied for morphometric evaluation amongst the testing groups, demonstrating significant statistical correlations with higher values of villi diameter, mucosal muscle layer thickness, villi surface area and mucosal absorption index.

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FOOD SAFETY AND TECHNOLOGY.
MANAGEMENT OF VETERINARY PRACTICE.
VETERINARY MEDICAL EDUCATION AND
ADMINISTRATION**

PL-05 Multi-actor farm health teams and plans designed to reduce the antibiotic use in dairy farms

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The Multi-actor Farm Health Teams (MAFHT) and Multi-Actor Farm Health Plans (MAFHP) designed to reduce the antibiotic use in dairy farms are innovative approaches of the European strategy to reduce antibiotic use in animals. MAFHTs include farmers, veterinarians and advisors covering complementary areas of interest in the field. In our approach were designed MAFHPs by using a model developed in the DISARM Project. This model

uses a participatory, farmer-led approach that was used previously in Denmark and the UK. Here we describe the particularities of MAFHPs in five Romanian dairy farms designed to improve the animal health and to reduce the need for antibiotic treatment. Farmers usually face management and/or health problems in correlation with the age category and physiological condition. The most common calf diseases were respiratory and enteric, but these problems did not create severe outbreaks of disease. Large dairy farms are more common with hoof disorders while small dairy farms are more exposed to udder diseases.

O-20 Efficacy of fumigation by cyphenotrin releasing smoke bomb against oriental cockroaches (*Blatta orientalis*)

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Cockroaches (Insecta, Blattodea) are known for their high reproductive potential, adaptability, and tendency to develop resistance to insecticides. The successful control requires a comprehensive approach and a combination of different methods, including fumigation (Total release fogger - TRFs). It is characterized by easy implementation and the ability to process large areas. Insufficient information about its real effectiveness was the reason to carry out our own laboratory studies in conditions similar to practice. Groups of oriental cockroaches ($n = 6$) caught in 2 pig farms were placed in 5 zones in a lab close to their natural location: open surfaces (№1-floor, №2-lab table, №3-opened cupboard), closed spaces (№4 - closed cabinet) and hard-to-reach areas (№5 – in upholstered furniture). Fumigations with cyphenothrin-releasing smoke bomb (Fumigol flush, LCB, France) were performed at a dose of 1 g per m^3 and 12-hour exposure. The effectiveness of the insecticide treatments was evaluated by appearance of a knockdown effect and the achieved mortality. The tests revealed a knockdown effect at the end of the exposure in 52.78% of cockroaches in open areas (№1,2,3), 58.33% in closed spaces (№4), but not in hard-to-reach areas (№5). At the end of the monitoring period (96 hours), 100% mortality was found in the groups located in zone №1, 91.67% in zones №2 and №4, 83.34% in №3 and 49.99% in hard-to-reach places (№5). The obtained results define fumigation as a highly effective method for controlling cockroaches density in easily accessible and open areas of the premises. In hard-to-reach areas, additional and targeted treatments should be implemented.

O-21 Comparative evaluation of laboratory ELISA and rapid ELISA tests for Ehrlichia canis and Anaplasma phagocytophilum antibody detection in dogs

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The aim of the study was to make a comparative evaluation of the effectiveness of two diagnostic approaches for the detection of antibodies against *Ehrlichia canis* and *Anaplasma phagocytophilum*. Two types of tests were used. One (Anti-*E. canis* ELISA Dog (IgG) and Anti-*A. phagocytophilum* ELISA Dog (IgG)) is an ELISA kit for the detection of relevant antibodies in the laboratory conditions, and the other (SNAP® 4Dx Plus) is a rapid ELISA diagnostic for simultaneous detection of antibodies against *A. phagocytophilum/A. platys*, *E. canis/E. ewingii*, *B. burgdorferi* and *Dirofilaria immitis* antigen, which is used for routine in-clinic test. A total of 61 blood samples obtained from dogs with clinical signs and haematological changes suspected of granulocyte anaplasmosis or monocyte ehrlichiosis were analyzed. We found antibodies against *E. canis* in 32 (52.46%) and *A. phagocytophilum* in 8 (13.11%) of the samples tested by laboratory ELISA. When using the SNAP test, the results were 11 (18.03%) and 35 (57.38%), respectively. Positive for antibodies against both pathogens were 15 (24.59%), using the laboratory ELISA kit, and those tested by SNAP test were 9 (14.75%) of the samples. The comparison of the two types of tests showed a greater coincidence of the results in the detection of antibodies against *Ehrlichia* spp. (52 samples) than against *Anaplasma* spp. (38 samples). We explain this difference with possible cross-reactions.

O-22 First record of Lipoptena cervi (Diptera: Hippoboscidae) among goats in Bulgaria

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The investigation was conducted on 4599 goats from eight breeds, naturally infected with ectoparasitic insects. The visit to the farms was paid after the owners alarmed for signs of considerable discomfort and itching among the animals. Two of examined flocks turned out to be infected with *Lipoptena cervi* (Linnaeus 1758) from the Hippoboscidae family, order Diptera, also known as deer ked or deer fly. Complete morphological description of detected 34 flies was performed. The total body length of male individuals varied from 2.754 to 3.754 mm, and that of females: from 3.508 to 4.500 mm. This is the first report about this insect species among goats in our country.

O-23 Microbiological approach for determination of the real bactericidal concentration (RBC) of some types of honey and royal jelly

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The present study evaluated the microbiological approach for determination of Real Bactericidal Concentrations (RBC) for some kinds of bee honeys, royal jelly and mix from royal jelly and rape honey (1:100 w/w). The research related to the development of the methodology and its algorithm are presented.

O-24 Effect of feeding bees inverted sugar syrup produced with confectionery invertase on bee honey specific optical rotation and absorption

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A study on the effect of intensive feeding bees with sugar syrup made with confectionery invertase on the specific optical rotation and absorption of the obtained bee honey has been carried out. It has been found that feeding bees with sugar syrup made with confectionery invertase has no negative influence on the specific optical rotation, but it results in considerable increase of absorption in bee honey.

O-25 Ветеринарна медицина и кръгова икономика

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Отговорностите на ветеринарната медицина в светлината на приетия от ЕС „План за насърчаване на кръговата икономика“ се определят от дейностите в нейните компетенции, имащи отношение към контрола и управлението на отпадъците в стремеж за максимално оползотворяване на ресурсите и мобилизиране за постигането на заложените в плана цели на неутралност по отношение на климата, опазване на околната среда, засилване на икономическата конкурентност. Предизвикателствата пред професията възникват и във връзка с един от акцентиранияте сектори- „храни“ и новата законодателна инициатива за повторно използване, въвеждане на продукти за многократно употреба под формата на опаковки, съдове и прибори. Идентифицирането на съществуващите основни направления от дейности, предприятия и производства, релиращи с компетенциите на ветеринарната медицина в светлината на концепцията за управление на отпадъците и кръговата икономика биха дали съответ-

ните възможности за оптимизация на процесите и идентифициране на евентуални слабости в нормативната уредба в областта.

За целта е наложително осъществяването на критичен анализ на съществуващата нормативна уредба, регулираща управлението на отпадъците от ветеринарномедицинската дейност в национален план, идентифициране на основните групи отпадъци от и касаещи ветеринарномедицинската дейност и набелязване на възможните направления за бъдещи оптимизации. Подобен анализ би бил възможен чрез ползването на предварително определен методически подход и структура за:

- системен анализ на нормативната уредба, регламентираща обществените отношения в сектора на управлението на отпадъците в Република България и наднационално ниво;
- идентифициране обектите на правното регулиране и основните компоненти на действащата правна рамка за сектора;
- определяне степента на комплексност и системност на съществуващата нормативна уредба в сектора;
- извеждане на обосновани заключения чрез утвърдени теоретически оперативни методи (анализ, синтез, сравнение, конкретизиране) и методи-умствени действия (системен анализ и синтез, индукция и дедукция).

O-26 Skills Lab in veterinary education - concept and opportunities

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Veterinary profession is associated with protection of animals and provision of animal health care services. Thus veterinary training is aimed at equipping all undergraduates with a set of basic skills and competencies known as “Day 1 Competencies”. Policies at international and European level have introduced a model for these competencies and veterinary universities have gradually developed and implemented new approaches to enhance knowledge and skills gaining. This paper analyses the concept of development of Skills Lab for veterinary education in some European universities with the aim to highlight the effects of this method of training. In addition, an insight is presented into the implementation of this modern educational tool for other health specialists. Finally, an example is given on the newly established veterinary simulation training centre at Trakia University and its opportunities for improvement of skills gaining for the undergraduate students.

O-27 Educational solutions for promoting integrative approaches in veterinary medicine

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The paper refers to the existing dichotomy between complementary (alternative) approaches vis-à-vis allopathic veterinary medicine as it aims at clarifying the concepts and highlighting the benefits of integrating different modalities in providing best care options for animal patients. Explanation is given on the scope of complementary/alternative approaches that can be considered in integrative interventions and the most often used modalities are briefly presented. In addition, the study provides insights into some educational solutions building on synergy between the conservative and integrative approaches in veterinary medicine. For this purpose, it analyses existing training courses offered in some European countries (Switzerland and Germany), bridging the two approaches by establishing a new mid-tier qualification in animal health care, “tierheilpraktiker”. Finally, it presents an example which exemplifies the advocated synergetic approach by showing how the collaboration between a veterinary practitioner and a tierheilpraktiker has benefitted the health of a critically injured horse champion with a fracture.

O-28 GS-441524 – a remedy for FIP or for COVID?

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Feline Infectious Peritonitis (FIP), caused by a mutated form of FCoV, is an infectious disease, of young cats that has long been regarded as a death sentence. The encouraging and recently proven efficacy of a drug, GS-441524 has been demonstrated from both official research and anecdotal data from owners of FIP-infected cats. The drug works against FIPV by blocking viral replication. However, due to the similarities with a drug (Remdesivir) which is in the midst of clinical trials for humans, it has not been approved for veterinary use. Remdesivir has been approved for the treatment of certain hospitalised COVID-19 patients and has also been a state of conditional marketing authorisation by the European Medicines Agency. A lack of veterinary approval has driven desperate FIP-infected cat owners to procure the drug from alternative routes. If fully approved for humans, GS-441524 may become available to veterinarians to prescribe the drug for off-label use.

P-17 Contamination of public places by zoonotic parasites in dog feces at New Belgrade in period 2017-2019 - a risk factor for public health

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Permanent increased of number of dogs present a hygienic and ecological problem of urban environment because we had a permanent contamination at public places are more with its faeces. As dogs are the true hosts of a large number of zoonotic parasites whose eggs are excreted in the feces and pollute public areas, they pose a constant potential danger to human public health. From these reason until 1995 we performed permanent parasitological control of grass area and public places at New Belgrade and here we presented our results of examination performed in period 2017-2019. We examined 98 samples of soil at green area and public places and 80 sample of dog faeces. by sedimentation and floatation method. Parasites contamination were detected at 55.10% (54/98) soil samples and 66,25% (53/80) dogs faeces. *Toxocara canis* were found at 30,33% soil samples *Ancylostomidae spp.* 29,31%, *Dipylidium caninum* at 28,9%, *Toxacaris leonina* at 11,28%, *Trichuris vulpis* at 10,32% and *Taenia -type* helminths at 6,1%. From protozoa species *Giardia duodenalis* were established at 15.78%, *Isospora* at 11.23% and *Cryptosporidium spp* at 5.3%. In faeces samples *Ancylostomidae spp.* were found at 47,5% faeces, *Dipylidium caninum* at 35,6%, *Toxocara canis* at 34,5%, *Trichuris vulpis* at 11,25%, *Toxacaris leonina* at 8,75%, *Taenia -type* helminths at 6.6%, *Strongyloides stercoralis* at 6,1% and *Angiostrongylus vasorum* at 2.6%. From protozoa species *Giardia duodenalis* were established at 45.78%, *Entamoeba histolytica* at 23.7%, *Isospora sp.* at 12.4% and *Cryptosporidium spp* at 9.3% samples.

P-18 The muscle phase of trichinellosis in experimentally infected mice is associated with up-regulation of dystrophin

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Dystrophin is a protein of the skeletal muscles, localized between the sarcolemma and the most external layer of the myofilaments of the skeletal muscle fiber. As a major protein of the dystrophin-associated glycoprotein complex it connects the actin with the other members of this complex that supports the stability of the sarcomeres during muscle contraction. Although dystrophin is expressed in minor quantities in healthy muscles, its absence due to genetic mutations results in a progressive development of severe and persistent combination

of myopathic symptoms, known as a muscular dystrophy. Overexpression of dystrophin in transgenic mdx mice as a model of Duchenne muscular dystrophy, however, eliminates successfully the dystrophic symptoms. The Nurse cell of the parasitic nematode *Trichinella spiralis* is a quite interesting experimental model of muscular myopathy because of its unusual nature. This structure derives from a portion of skeletal muscle cell, invaded by infectious larvae of *Trichinella*, after passing through extreme genetic, functional and morphological changes. Even if the Nurse cell loses completely its contractile properties, it still remains well integrated within the surrounding healthy muscular cell – a fact that raises the question about the fate of the dystrophin-associated glycoprotein complex.

In this work, we investigated the mRNA and protein expression of dystrophin in methacarn fixed paraffin tissue sections of mouse skeletal muscles, collected at days 0, 14 and 40 after infection with *Trichinella spiralis*, by RT real time-PCR and immunohistochemistry. The successful parasitic invasion was verified by the presence of amplification product, specific for the ESV segment of *T. spiralis* in the samples from days 14 and 40 after infection, which on the other hand correlated with up-regulation of the mouse *Dys* gene. These results were completed by immunohistochemistry showing an increased intracellular expression of the dystrophin protein at the same period.

The dystrophin supports the strength of the muscle fibers and its absence results in sarcolemma deformations and compromises the mechanical resistance of the dystrophin-associated glycoprotein complex and its connections with the surrounding myofibrils. As it seems, after invasion of the sarcoplasm by *Trichinella* and despite of its consequent reconstruction, the biosynthesis of dystrophin is significantly elevated in order to provide the newly formed Nurse cell with stability within the environment of normally contractile surrounding muscular tissue. It is quite possible that *Trichinella* stimulates this biosynthesis in order to secure the species survival. In that case, this nematode could be a key factor for relieve of the symptoms of the muscular dystrophy diseases – an event of extremely important social significance.

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P-19 The development of nurse cell of *Trichinella spiralis* is associated with down-regulation of neuronal nitric oxide synthase (nNOS)

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Nitric oxide synthases are an enzyme family that catalyze the release of nitric oxide from L-arginin. The nitric oxide is an important transmitter in many processes of cell signalling. In skeletal muscles, the neuronal isoform of Nitric oxide synthase (nNOS) is localized in the sarcoplasm as a component of the Dystrophin-associated glycoprotein complex, attached to the cis-domain of dystrophin. This enzyme is irreplaceable in supporting of the skeletal

muscle cell integrity and its contractile function, and its de-regulation is a pathogenic symptom of many neuromuscular diseases. The Nurse cell of the parasitic nematode *Trichinella spiralis* is a quite interesting experimental model of muscular myopathy because of its unusual nature. This structure derives from a portion of skeletal muscle cell, invaded by infectious larvae of *Trichinella*, after passing through extreme genetic, functional and morphological changes. Even if the Nurse cell loses completely its contractile properties, it still remains well integrated within the surrounding healthy muscular cell – a fact that raises the question about the fate of the dystrophin-associated glycoprotein complex.

In this work, we investigated the mRNA and protein expression of nNOS in methacarn fixed paraffin tissue sections of mouse skeletal muscles, collected at days 0, 14, 24 and 35 after infection with *Trichinella spiralis*, by RT real time-PCR and immunohistochemistry. The successful parasitic invasion was verified by the presence of amplification product, specific for the ESV segment of *T. spiralis* in the samples from days 14, 24 and 35 after infection, which on the other hand correlated with down-regulation of the mouse *Nos1* gene within this period. These results were completed by immunohistochemistry showing decreased and even absent expression of the nNOS protein in the portions of invaded sarcoplasm at days 14, 24 and 35 after infection.

Destabilization of the dystrophin-associated glycoprotein complex is associated with increased levels of Ca^{2+} as a consequence of the continuing activity of nNOS, which results in muscular atrophy with progressive weakness and fatigue. It is quite possible that the down-regulation of nNOS into the Nurse cell of *Trichinella spiralis* is rather a protective mechanism maintaining a stable environment for the parasite.

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P-20 PCR identification of lungworm infections in cats and martens in Bulgaria

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The aim of the study was to identify the species variety of lungworms in some carnivorous animals in Bulgaria found after traffic accidents. A total of 12 animals was involved in this research, including six domestic cats (*Felis silvestris catus*), two hybrids, a wild cat (*Felis silvestris silvestris*), and three beech martens (*Martes foina*). Lung samples have been sent to a PCR analysis for novel multiplex PCR, which is able to identify simultaneously different species of lungworms, including *Aelurostrongylus abstrusus*, *Troglostrongylus brevior*, *Angiostrongylus chabaudi* and *Capillaria aerophila*. The results revealed single infections with *A. abstrusus* in three cats; *T. brevior* in one cat. Mixed infection with both lungworms was found in two cats. There was not detected any DNA of *A. chabaudi* and *C. aerophila*. None of those parasites were found in samples from the beech martens.