

РЕЗИЮМЕТА НА НАУЧНИ ТРУДОВЕ

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след предходна хабилитация

представени за участие в конкурс за академичната длъжност „Професор“, в област на висше образование 6. Аграрни науки и ветеринарна медицина, професионално направление 6.3. Животновъдство, съгласно чл. 26 от ЗРАСРБ и допълнителните изисквания съгласно приложение 8.1 на ПРАСТрУ

1. Хабилитационен труд – монография (Показател В 3.)

- 1) Р. Михайлов, 2022, „Зоопаркът в мен“, ИК „Кота“, Стара Загора, ISBN:978-954-305-617-0 - Монография

Монографията разглежда някои от дейностите в Зоопарковете. Липсата на систематизирана, научна и образователна информация за тези дейности в нашата страна, и двадесет годишния ми натрупан опит в Зоопарк Стара Загора ме провокира да разкажа на аудиторията за някои от тях. Моля, да бъде предварително извинен, ако на места съм бил прекалено емоционален, но няма как да го подмина, защото то е „вътре в мен“.

Опитал съм се да разкажа и анализирам, някои от дейностите в зоопарка, като обогатяване на колекциите, транспорт и настаняване на животни, отглеждане на млади животни, спасяване на животни попаднали в беда или неестествена среда. Не съм подминал и неудачите – бягства на животни от зоопаркове и действия на зоопарковите специалисти в такива ситуации. Надявам се освен, като научна литература, монографията да бъде в помощ на широк кръг студенти от специалности с професионални направления, биологични науки, аграрни науки и ветеринарна медицина.

Предполагам, че книгата ще бъде вдъхновяваща за младите хора, защото работата в Зоопарка носи дух на приключение и докосване до част от „света“ на животните.

Аз няма да спра да обичам моите животни!!!

Abstract. The monograph examines some of the activities in the Zoos. The lack of systematized, scientific and educational information about these activities in our country, and my twenty years of experience in Stara Zagora Zoo provoked me to tell to the audience about some of them. Please apologize in advance if I was too emotional in some places, but I can't ignore it because it's "inside me".

I have tried to tell and analyze some of the activities in the zoo, such as enriching the collections, transporting and housing animals, raising young animals, rescuing animals in distress or unnatural environments. I have not overlooked the failures - escapes of animals from zoos and actions of zoo specialists in such situations. I hope that, in addition to scientific literature, the monograph will be helpful to a wide range of students from specialties in professional fields, biological sciences, agricultural sciences and veterinary medicine.

I guess the book will be inspiring for young people, because working in the Zoo brings a spirit of adventure and touching to part of the “animal” world.

I will never stop loving my animals !!!

2. Публикувана монография, която не е представена като основен хабилитационен труд (Показател Г 5.)

1) **Радослав Михайлов**, Звезделина Киркова, Александра Даскалова, 2020, „Независим анализ за състоянието на популацията от безстопанствени кучета в Република България и свързаните с нея проблеми“, ИК „Кота“, Стара Загора, ISBN: 978-954-305-553-1. – **Монография**

Световната статистика показва, че днес в света са създадени над 300 породи домашни кучета, чийто общ брой надхвърля 400 млн. Наред с положителните страни на това продължително и взаимноизгодно съжителство обаче, по едни или други причини във взаимоотношенията между човека и кучето са възникнали и определени проблеми. Ясно е, че човека като мислещо същество играе доминираща роля в отношенията си с кучето и в определени случаи неправилното човешко действие и поведение води до формирането на една нова група животни представители на вида *Canis lupus familiaris* - безстопанствени кучета. Причините за възникването им са липсата на знания и опит в отглеждането на кучета, неконтролирано размножаване и най - общо казано ниска лична и обществена култура. Свободноживеещите неконтролирани от човека кучета имат висок репродуктивен потенциал, което е причина за бързото нарастване на техния брой и броя на техните популации. Това от своя страна създава условия за възникването и пренасянето на редица заболявания, някои от които представляват голяма опасност и за човека (зоонози). От друга страна в свободни условия безстопанствените кучета проявяват агресивност характерна за техните диви предшественици - вълците. Това води не само до шумни и нелицеприятни стълкновения между отделни кучешки глутници, но и до опасни и понякога смъртоносни нападения върху хора. Всичко горе посочено определя актуалността на темата на монографията.

Abstract. World statistics show that more than 300 breeds of domestic dogs have been created in the world today, the total number of which exceeds 400 million. Along with the positive sides of this long and mutually beneficial coexistence, however, for one reason or another in the relationship between man and dog, certain problems occur. It is clear that man, as a thinking being, plays a dominant role in his relationship with the dog, and in certain cases, improper human action and behavior leads to the formation of a new group of animals, representatives of the species *Canis lupus familiaris* - stray dogs. The reasons for their occurrence are the lack of knowledge and experience in raising dogs, uncontrolled breeding and, generally speaking, low personal and public culture. Free-ranging dogs not controlled by humans have a high reproductive potential, which is the reason for the rapid increase

in their numbers and the number of their populations. This, in turn, creates conditions for the emergence and transmission of a number of diseases, some of which pose a great danger to humans as well (zoonoses). On the other hand, in free conditions, stray dogs show aggressiveness characteristic of their wild predecessors - wolves. This leads not only to noisy and unsightly clashes between individual dog packs, but also to dangerous and sometimes deadly attacks on humans. All of the above determines the topicality of the monograph's topic.

3. Статии и доклади, публикувани в научни издания, реферирани и индексирани в световноизвестни бази данни с научна информация (Показател Г 7.)

- 1) **R. Mihaylov**, R. Dimitrov, V. Yordanova, 2012. Comparative electronmicroscopical study of the enterocytes of the duodenum of the Japanese quail (*Coturnix japonica*) and the wild type (*Coturnix coturnix*). *Agricultural Science and Technology*, 4, (3): 328-331, *ISSN(print) 1313-8820 ISSN(online) 1314-412X*

Abstract: The main goal of the study was to be determined some age linked ultrastructure features of the duodenum in specific bird species. The investigated are 20 birds from each – Japanese and Wild quails. They were divided into four age groups (1-st, 20-th, 45-th и 60-th day of hatching; 5 birds in each age group). The materials for the electron microscopic study were obtained from the middle section of the duodenum. Onto the apical surface of the enterocytes of the duodenum with the one day old Japanese and Wild quails were determined evenly located and with similar height microvillies. They covered the apical surface of the enterocytes and around the apical parts was seen glycocalyx. The height of the duodenal microvilli of the twenty days old Japanese quails was greater from those of the one day old. The 45 days old and 60 days old quails the microvilli, covering the apical surface of the enterocytes were evenly placed, but their height was continuously growing. The height of the duodenal microvilli of the one day old Japanese and Wild quails was equal. With the 20, 45 and 60 days old quails, the height of the microvilli of the Wild type were higher from the microvillies of the Japanese quails. We believe the difference of the microvillies height of the duodenum with the Wild and the Japanese quail is due to the distinction in the nutritive habits and requirements of the investigated birds. The Wild quail is a bird, which is in a need of greater reabsorption mucosa of the small bowel and most likely is the reason the duodenal microvilli to be higher compare to the Japanese one.

- 2) V. Radev, I. Varlyakov, **R. Michailov**, 2013, “Effect of different lipid and dietary levels on rumen ciliate fauna and cellulolytic activity in yearling rams”, *Agricultural science and technology*, V 5, N 3, 294- 298, *ISSN(print) 1313-8820 ISSN(online) 1314-412X*

Abstract: An experiment was conducted to evaluate the effect of rations with different lipid and protein levels on total counts and generic composition of rumen ciliates, and bacterial cellulolytic activity in the rumen of yearling rams. Three rations, conditionally termed ration I, ration II and ration III were tested. Ration I contained 1.00 kg ground barley and 1.00 kg meadow hay. To the others, different protein and lipid source was added. Ration II consisted of 1.00 kg meadow hay, 0.800 kg barley mash and 0.200 kg sunflower meal. Ration III contained 1.00 kg meadow hay, 0.800 kg barley mash and 0.200 kg sunflower expeller. Rations differed with respect to their lipid and protein contents. They were offered twice daily –8:00 AM and 1:00 PM. The

experiment was performed with nine Blackhead Pleven yearling rams, with initial average body weight 45.2 kg. They were divided in three groups of three animals each. Twenty days prior to the trial, the animals were fitted with cannulae of the dorsal rumen sac. Rumen content was sampled for 4 consecutive days, three times a day: before feeding, 2.5 h and 5 h after feeding. The total counts and generic composition of rumen ciliates were determined. The cellulolytic activity in the rumen was determined in vivo after 24-hour incubation. Feeding rations with different sources of proteins and lipids did not change significantly the total counts and the composition of rumen ciliates in yearling rams. Feeding a ration containing sunflower meal increased significantly ($p < 0.01$) rumen cellulolytic activity as compared both to base ration composed of barley mesh and meadow hay and sunflower expeller supplemented ration.

- 3) D. Chotinsky and R. Michaylov, 2013, "Effect of probiotics and avotan on the level of thyroid hormones in the blood plasma of broiler chickens", Bulgarian Journal of Agricultural Science, 19 (No 4), 817-821, **SJR 0.162**, ISSN 1310-0351- print, ISSN 2534-983X - online

Abstract: A feeding experiment was conducted to evaluate the effects of Lacto Sacc, Yea Sacc and Avotan in the diets on the level of thyroxine, triiodothyronine and thyrotrophin hormone in the blood plasma of broiler chickens. Six hundred day old commercial broiler chickens were weighted and assigned randomly in four dietary treatments: 1. a basal diet (control); 2. a basal diet + 0.1 % Lacto Sacc; 3. a basal diet + 0.1 % Yea Sacc ; 4. a basal diet + 0.01 % Avotan. Each dietary treatment had three replicates with 50 broiler chickens per replicate.

The quantity of thyroxine did not change significantly in the supplementation of 0.1 % Lacto Sacc, 0.1 % Yea Sacc and 0.01 % Avotan in the diets of broiler chickens. The level of triiodothyronine in the blood plasma increased insignificantly with the supplementation of 0.01 % Avotan, while this level significantly increases in the supplementation of 0.1 % Lacto Sacc and 0.1 % Yea Sacc in the diets of broiler chickens. Plasma thyrotrophin levels were not significantly different between untreated and treated broiler chickens.

- 4) R. Mihaylov, R. Dimitrov, E. Raichev, D. Kostov, K. Stamatova-Yiovcheva, D. Zlatanova, B. Bivolarski, 2013. Morphometrical features of the head skeleton in Brown Bear (*Ursus Arctos*) in Bulgaria. Bulgarian Journal of Agricultural Science, 19 (2): 331-337, **SJR 0.162**, ISSN 1310-0351- print, ISSN 2534-983X - online

Abstract: Fifteen craniometrical indices of the head skeletons in forty brown bears (*Ursus arctos*) found in Bulgaria were studied. Data for the greatest length of the head skeleton and condylobasal length as well as the results of those motivated us to propose that the greatest length of the head skeleton in Bulgarian population of brown bears is from 280 mm to 350 mm, and the condylobasal length is from 276 mm to 304 mm. Our results for length skull (cranium) and face showed that face length were 35.33% of head skeleton length. The length, rostral and caudal width of the bone palate demonstrated that the palate widened in caudal direction. The basal length of the skull was with close value to bone palate length and it could be accepted that the caudal edge of the bone palate was approximately in the middle of the ventral surface of head skeleton. The zygomatic width of the specimens was 59% from the greatest length of the head skeleton.

- 5) D. Kostov, R. Dimitrov, K. Stamatova-Yovcheva, A. Atanasov, P. Yonkova, D. Vladova, **R. Mihaylov**, D. Yovchev, 2014. Some heavy metals' concentrations in the metacarpal bones of paleontological cattle from Azmashka Settlement Hill. J. Fac. Vet. Med. Istanbul Univ., 40 (1): 14-19, Scopus.

Abstract: The aim of the present study was to investigate and determine concentrations of some heavy metals in the cattle metacarpal bones, found from Azmashka settlement hill. They belonged to four periods: Early Neolith (EN), Early Halkolith (EH), Late Halkolith (LH) and Early Bronze (EB). The natural bone material was obtained from the archaeological site Azmashka village mound, found 6 km east of Stara Zagora (Bulgaria) and also from the territory of Hrishteni village, following radiocarbonic analysis. In the sampling an atomic absorption spectrophotometry was used. The samples have been burned dry and dissolved in acid until solution with optimal element concentration. Higher concentrations of iron (Fe), copper (Cu), zinc (Zn), manganese (Mn), lead (Pb), chrome (Cr) and magnesium (Mg) were observed. The quantity of Fe, Cu, Zn, Mn and Pb were with higher values at Early Halkolith, compared to the same in the other periods. The highest heavy metals' concentrations were found, as following: iron, cooper, manganese, lead – at Early Halkolith and zink, chrome and magnesium – at Late Halkolith. The lowest heavy metals' concentrations were found, as following: iron, manganese, chrome, magnesium – at Early Neolith and cooper, zink and lead– at Early Bronze. Differences in the other elements' concentrations from the studied periods weren't significant. Qualitative differences influenced by the heavy metals in the bone structure weren't found. The content of heavy metals in the studied metacarpal bone material is considerably high compare to the normal values, mentioned by some researchers studied other species. The trend of concentration increasing is from Early Neolith to Early Bronze. This is due to the metacarpal bone contamination with soil, as which has been polluted from many years by the industrial manufacture of the nitrogen fertilizer.

- 6) R. Dimitrov, **R. Michaylov**, St. Ribarski, V. Doichev, V. Yordanova, 2014. Comparative morphology of the hyoid apparatus in wild boar (*Sus scrofa*) and domestic pig (*Sus scrofa domestica*). Philippine Journal of Veterinary Medicine, 51, (1): 51-55, **IF-0,152, SJR-0.19, ISSN 0031-7705**

Abstract: The morphological features and measurements of the hyoid apparatus of nine wild boars, *Sus scrofa* (fve male and four female, 2 years old, 148 ± 2.3 kg body weight) and nine domestic pigs, *Sus scrofa domestica* (four male and fve female, 18 months old, 152 ± 2.9 kg body weight) were determined and compared. In both species, the basihyoid had a rostroventral projecting rudiment of the lingual process. At the caudal edge, the basihyoid formed an incisure which was more distinct in the domestic pig. The dorsal surface of the basihyoid in both animals formed a dimple which was better shaped and larger in the wild boar than in the domestic pig. In the wild boar, the left and right thyrohyoid were attached to the basihyoid at a smaller angle compared to the domestic pig. In the wild boar, the keratohyoid was oriented in a craniodorsal direction to the basihyoid. The stylohyoid was longer by 25% in the wild boar than in the domestic pig. The results suggest differences in the function of the hyoid muscles, in relation to

masticatory and swallowing process, since the food of wild boar is rougher compared to that of the domestic pig.

- 7) Binev R., Valchev I., Stoyanchev K., **Mihaylov R.** & Nikolov Y., 2014, "Changes in blood enzyme activities after experimental acute intoxication of quails (*Coturnix coturnix*) with the carbamate insecticide carbofuran", Bulgarian journal of Veterinary Medicine, 17 № 4, 331-337, **SJR 0.162**, ISSN 1311-1477 (print); ISSN 131-3543 (online)
Abstract: Carbamate anticholinesterase pesticides are widely used for plant protection. Their common application together with the high toxicity, are responsible for the increasing number of intoxication accidents with wild animals (mammals and birds). The present experiment aimed to determine the changes occurring in blood enzyme activities of quails after experimental acute intoxication with the carbamate insecticide carbofuran (Carbosan 35 CT). Quails were divided into 5 groups: one control and 4 experimental. They were treated by increasing single doses of the tested pesticide: 1.05 mg/kg (experimental group I), 2.1 mg/kg (experimental group II), 5.25 mg/kg (experimental group III) and 10.5 mg/kg (experimental group IV), corresponding to 1/10 LD₅₀, 1/5 LD₅₀, 1/2 LD₅₀ and LD₅₀ - oral doses for albino rats, respectively. Prior to the treatment (hours – 48, –24 and 0) and 1, 3, 5, 7, 24 and 48 hours thereafter, blood was sampled from *v. subcutanea ulnaris* for analysis of activities of serum acetylcholinesterase (AChE), aspartate aminotransferase (ASAT), alanine aminotransferase (ALAT), alkaline phosphatase (AP), creatine kinase (CK) and gamma glutamyltransferase (g-GT). The tested carbamate insecticide caused reduction in AChE activities, along with increased ASAT, ALAT, AP and CK concentrations. There were no changes in g-GT concentrations.
- 8) Radev V., I. Varlyakov, T. Slavov, **R. Mihaylov**, 2014, Effect of dietary supplement Zarnela on some duodenal chyme parameters in yearling rams, Agricultural Science and Technology, vol.6, №2, 179 - 183. ISSN(print) 1313-8820 ISSN(online) 1314-412X
Abstract: The investigation was carried out with five yearling sheep, Stara Zagora meat type and Pleven Blackhead crosses. The average live body weight of animals at the beginning of the experiment was 55±4 kg. The effect of supplementation of animal rations with dried distillers grains with solubles (DDGS) on duodenal chyme pH, total volatile fatty acid and ammonia concentrations was studied. Zarnela – dried distillers grains with solubles is a by-product of wheat ethanol production manufactured by the ethanol producing enterprise at Gorna Oryahovitsa, Bulgaria. The experiment was conducted in two periods – control and experimental. During the control period, animals were fed a ration consisting of 1.000 kg meadow hay and 1.000 kg barley mash. During the experimental period, the ration contained 0.800 kg barley mash, 0.200 kg DDGS (Zarnela) and 1.000 kg meadow hay. The dietary supplementation with Zarnela at 0.200 kg had the following effects on studied duodenal chyme parameters: duodenal chyme pH increased both before (p<0.05) and 2.5 hours (p<0.01) after feeding, an insignificant increase in duodenal chyme total volatile fatty acid concentrations, both before and after feeding was established and duodenal chyme ammonia concentrations became higher before (p<0.05) and after feeding (p<0.01).
- 9) Slavov, T., V. Radev, **R. Mihaylov**, I. Varlyakov, 2014, Effects of different dietary

nitrogen sources on duodenal chyme parameters in yearling sheep, *Agricultural Science and Technology*, Volume 6, Number 3, September, 2014, pp. 283-287. *ISSN(print) 1313-8820 ISSN(online) 1314-412X*

Abstract: A physiological trial was conducted to evaluate the effect of diet supplementation with non-protein nitrogen compounds Optigen and urea through determination of duodenal chyme pH, volatile fatty acids and ammonia concentrations in yearling sheep. The experiment was carried out with 6 yearling sheep, Pleven Blackhead × Suffolk crosses. The experiment was conducted in three periods – control and two experimental. During the control period, the ration of animals consisted of 0.700 kg barley and 1.000 kg meadow hay. During the first experimental period, the ration was supplemented with 0.012 kg Optigen, and during the second experimental period – with 0.0106 kg urea. Both supplements (Optigen and urea) did not have an effect on duodenal chyme pH and a trend towards slight increase in postprandial hours was noted. The addition of Optigen led to statistically significantly increased volatile fatty acid ($p < 0.01$) as early as the first hour and peak values 2.5 h after feeding, whereas urea supplementation resulted in minimum elevation only 2.5 hours after feeding. The most pronounced effect of Optigen supplementation was observed on duodenal chyme ammonia levels, in particular 2.5 hours after feeding ($p < 0.001$ vs control period and $p < 0.01$ vs dietary urea supplementation).

- 10) Varlyakov, I., V. Radev, T. Slavov, **R. Mihaylov**, 2015. Ethological and haematological indices in yearling sheep fed various dietary nitrogen sources., *Agricultural Science and Technology*, vol.7, №4, pp 423-430, *ISSN(print) 1313-8820, ISSN(online) 1314-412X*

Abstract: A physiology experiment was conducted to evaluate the effects of diet supplementation with non-protein nitrogen compounds Optigen and urea. The trial comprised three periods: control – yearling sheep were fed ration with barley, sunflower meal and meadow hay; first experimental – the same ration was supplemented with 12 g Optigen and second experimental – the ration was supplemented with 10.6 g urea. The addition of Optigen resulted in increased appetite and faster consumption of the food as seen from lower feeding time and increased rumination time. The welfare of animals was good as seen from the low ratio of time spent ruminating in standing position to total rumination time and the dominating values of rumination and rest times without statistically significant differences between experimental periods. There were no differences between times spent standing and loafing, including movement in side the box, which is an indirect index for lack of discomfort and reliable testimony for the conditions of the present experiments. The blood picture results allowed affirming that the health status of experimental animals was within the reference limits. Proofs in support of this thesis were the fact that lower red blood cell counts were compensated by the higher haemoglobin content, whereas white blood cell counts were normal and accompanied by nutritional leukocytosis during all three study periods.

- 11) R. Binev, I. Valchev, **R. Mihaylov**, Y. Nikolov, 2016, “Clinical toxicological investigations on acute carbofuran intoxication in quails (*Coturnix coturnix*)“, *Agricultural science and technology*, VOL. 8, No 4, pp 302-305, *ISSN(print) 1313-8820, ISSN(online) 1314-412X*

Abstract: The present study was conducted to evaluate the toxic effects of the carbamate insecticide carbofuran (Carbosan 35 ST) after experimental acute intoxication in quails (*Coturnix coturnix*). Experiments for monitoring of changes in clinical indices and some haematological parameters. Quails were divided into 5 groups: one control and 4

experimental. They were treated by increasing single doses of the tested pesticide: 1.05 mg/kg (experimental group I), 2.1 mg/kg (experimental group II), 5.25 mg/kg (experimental group III) and 10.5 mg/kg (experimental group IV), corresponding to 1/10 LD50, 1/5 LD50, 1/2 LD50 and LD50 oral doses for albino rats, respectively. In three consecutive days prior to the treatment (hours -48, -24 and 0) and 1, 3, 5, 7, 24 and 48 hours thereafter, the clinical status was registered to evaluate rectal body temperature, faeces excretion, locomotion, perception etc. and were obtained blood samples from v. subcutanea ulnaris or v. metatarsa ulnaris for analysis of haemoglobin content (HGB). It was found out that the tested carbamate insecticide had some toxic effects manifested clinically with hyperaemia, anorexia, difficulty in focusing the eyes, salivation with thick saliva discharge, diarrhoea, generalised tremor, clonic tonic spasms (especially of cervical muscles), depression and hypochromia. The described changes were the most obvious between post treatment hours 1 and 3, and then the studied parameters regained their control values. The tolerated dose of carbofuran was 1.05 mg/kg (1/10 LD50 for albino rats), the minimum toxic dose was 2.1 mg/kg (1/5 LD50 for albino rats), and minimum lethal dose – 10.5 mg/kg, equal to LD50 for albino rats.

- 12) Mihaylov, G., Tsachev, I., Petrov, V., Marutsov, P., Zhelev, G., Koev, K., Mihaylov, R.,** 2016, A clinical case of trichophyton menthagrophytes and microsporum canis co-infection in a siberian tiger (*panthera tigris altaica*). Bulgarian Journal of Veterinary Medicine, 19(4), pp. 340-345 – **Q4** (SCOPUS), **SJR 0.162**, *ISSN 1311-1477 (print); ISSN 131-3543 (online)*

Abstract: A clinical case of co-infection with *Trichophyton menthagrophytes* and *Microsporum canis* in a Siberian tiger (*Panthera tigris altaica*) is described. Clinical and laboratory mycological examinations were carried out. Two dermatophytic species were isolated from hairs, crusts and swab samples from different parts of the cage. A systemic oral therapy with itraconazole (Sporanox, Janssen) at a dose of 10 mg/kg with food was initiated and body surface was treated with 0.2% enilconazole solution (Imaverol, Janssen). The skin lesions of the tiger healed after the treatments, but recurred a month later. We recommended a thorough disinfection of the cage area inhabited by tigers and inventory in it. The therapeutic protocol was repeated. Clinical signs disappeared. Information about disease recurrence was obtained.

- 13) R. Mihaylov, R. Dimitrov, Sv. Krastev, K. Stamatova-Yovcheva,** 2018. Morphology and anomaly of the skull of Zoo Lynx Lynx (Carnivora: Felidae): Ecological aspects for further reintroduction. Bulgarian Journal of Agricultural Science, 24, (2): 270-274. **Q3** (SCOPUS), **SJR -0.261**, *ISSN 1310-0351- print, ISSN 2534-983X - online*

Abstract: Two skulls of zoo lynxes and one lynx skull with unknown origin have been studied. One of the lynx was male and seven years and six months old, imported from Russia and lived in the zoo in Stara Zagora. The second one was two years and six months old, imported from Czech Republic. The third lynx was from osteological collection and was with unknown origin. A comparative morphological investigation was conducted, using native and radiological study. After the osteological treatment of one skull, it was found that there was a bone defect in the caudal part of the frontal bones, which motivated our study. According to us, it was a bone anomaly, resulted by the inbreeding of the animal, often leading to the occasional appearance of asymptomatic bone defects. We suggest the origin of the lynxes to be studied carefully in their reintroduction in order to

prevent the displacement of inbreeding animals. Thus, we propose that it is better to be studied the lynx ancestor for future reintroductions of the animal, which is of great importance for its ecology and surviving.

- 14) Omer Gurkan Dilek, R. Dimitrov, K. Stamatova-Yovcheva, D. Yovchev, **R. Mihaylov**, 2019. Importance for experiments in human medicine of imaging modalities for macroanatomical and histological study of rabbit suprarenal glands. *Med. Weter.*, 75, (11): 684-692, DOI: [dx.doi.org/10.21521/mw.6286](https://doi.org/10.21521/mw.6286), **IF Scopus-0.383, SJR-0.186**

Abstract: The morphological characteristics of the rabbit adrenal glands are currently investigated using routine imaging modalities. The aim of the study was to collect and interpret major findings and information in the literature on the rabbit as an animal model for investigations in humans. The suprarenal glands of thirty-four mature, clinically healthy New Zealand rabbits were studied using anatomical, routine histology, radiology, computed tomography, ultrasonography, and magnetic resonance imaging methods. The results demonstrated that the rabbit suprarenal glands are paired ellipsoid organs. The right gland was close to the right kidney, whereas the left gland was located at a distance from the left kidney. The capsule was composed of dense connective tissue. The parenchyma consisted of three zones: zona glomerulosa, zona fasciculate, and zona reticularis. The medulla was in the center of the glandular parenchyma. The glands' radiological and CT features defined their position relative to the right and left kidneys. The right suprarenal gland was with normal attenuation. The left suprarenal gland was located at a distance from the left kidney. The US features of the glands demonstrated variability in darkness and contrast, revealing specific histological features. The MRI peculiarities of the glands defined them as well visible findings.

- 15) **R. Mihaylov**, R. Dimitrov, K. Stamatova-Yovcheva, F. Fejzulla, 2019. Investigation of the opportunities for introduction of the wild turkey (*Meleagris gallopavo*) in the territory of Bulgaria. *Bulgarian Journal of Agricultural Science*, 25, (4): 717-723. **SJR-0.191, ISSN 1310-0351- print, ISSN 2534-983X - online**

Abstract: In Biology the introduction is the establishment of outlandish species within the borders outside their natural range (natural habitats) under conditions in which they have not previously developed. The aim was to investigate the possibilities of introduction of wild turkey (*Meleagris gallopavo*) in the territory of Bulgaria and the changes to which they might have led to the morphological features of this species. The study was carried out in the territory of Trankovo village, Stara Zagora region (the pheasantry is a part of Mazalat), the territory of Stara Zagora Zoo and in a licensed game farm Graus.

The used methods are:

- interviews with poultry specialists;
- photographic method – photo-documentation of areas, inhabited by wild turkeys and photo-documentation of morphological features of live wild turkeys;
- biometric morphological method.

In Bulgaria there are real opportunities for introduction of wild turkey due to the presence of objects with parental herds – the pheasantry in the village of Trankovo and the Zoo in Stara Zagora.

The program for the production and displacement of birds bred in farms does not work

with wild turkey, although it has been included in the program from 2006. Hunting farms prefer to buy wild turkeys ready for shooting from the pheasantry in Trankovo rather than rear them in the hunting area. When trying to introduce a group of wild turkeys, it should be composed of young and adult birds as well. The birds that are displaced should be at a distance from the rest that they cannot hear the birds from the parent flock. In order for a higher percentage of birds to survive, strict control must be carried out over the harmful predators – foxes, jackals and martens.

- 16) K. Stamatova-Yovcheva, R. Dimitrov, **R. Mihaylov**, Omer Gurkan Dilek, 2020. Color Doppler anatomical assessment of the vessels in the rabbit liver. *Bulgarian Journal of Agricultural Science*, 26, (3): 669-673. **SJR-0.248**, *ISSN 1310-0351- print, ISSN 2534-983X - online*

Abstract: The aim of the present study was to investigate the geometry, topography and trajectory of the rabbit liver's vessels by color Doppler US. Ten sexually mature healthy clinically New Zealand white rabbits, aged 8 months and weighed from 2.8 kg to 3.2 kg have been studied. The results were related to the color geometry of the vessels, which was used to define their topography. The visualization of the rabbit liver blood and biliary vessels was real and corresponded to the variations of the color Doppler spectrum from blue to red gamma. The hemodynamic data were simultaneous to the morphological results. Both they represented anatomical information for the studied vessels. The present investigation is with practical application in the morphological science. It is summarized that the Doppler US study of the rabbit liver is suitable to obtain detail information for the anatomical and physiological characteristics of the organ. In conclusion the results could be used as a morphological base for investigation in human and rabbits.

- 17) **R. Mihaylov**, K. Kirilov, 2022, Morphological study on hairs from mammalian predators in Bulgaria, *Agricultural science and technology*, vol. 14, No 2, pp 102-107, *ISSN(print) 1313-8820 ISSN(online) 1314-412X*, DOI 10. 15547/ast. 2022.02.025

Abstract: The morphological characteristics of the hairs can be used for species identification in ecological and zoological studies, in forensic and forensic veterinary examinations. Large-scale hairs model is one of the important identification features and can be used as a "fingerprint". In this study the morphological hairs characteristics of nine Bulgarian carnivore mammals were investigated. The values for the length, total hairs diameter, medullary diameter and medullary index were determined. The combined use of hairs parameters and the medullary index (MI) are a guarantee of greater reliability in species identification. For comparison, we observed under a microscope hairs fixed by transparent tape in order to offer a quick test for species identification.

- 18) **R. Mihaylov**, D. Kanakov, Sv. Krastev, Zh. Zheleva, 2022, Investigation the effectiveness of a utility model – "Remote piston injector for veterinary use", *Agricultural science and technology*, vol. 14, No 3, pp 82-84, *ISSN(print) 1313-8820 ISSN(online) 1314-412X*

Abstract: The effectiveness of a utility model – remote piston injector for veterinary use was investigated. The injector is from the field of applied veterinary technology, hand tools, instruments and accessories for the application of treatment and prevention of domestic and wild animals. It can be used safely for the application of various types of veterinary medicinal products in relation to animal health and welfare. The utility model is

part of the technique that serves to improve veterinary care and is a mobile tool related to the prevention, diagnosis and treatment of animal diseases. It has been found that it successfully provides treatment to dangerous animals with drugs, vaccines, etc. from a distance safely for humans, using cheap disposable or remote syringes that are protected by the injector housing.

4. Статии и доклади, публикувани в нереферирани списания с научно рецензиране или публикувани в редактирани колективни томове (Показ. Г 8.)

- 1) Марин Кабакчиев, Атанас Генчев, **Радослав Михайлов**, 2008 “Проучване върху ритъма на снасяне при кокошки носачки”, Международна научна конференция, Българската наука и Европейското изследователско пространство, 5-6 юни Стара Загора, Съюз на учените в България - Стара Загора, ISBN 978- 954 – 9329 – 44 – 5.

Abstract:

The hours of laying the eggs during the day were studied at two groups of layers with white and brown egg shell. The clutches and pauses between them have been calculated and the distribution of laying in the day. The longest interval between forming two subsequent eggs is 32hour and the shortest – 20hour. Highest rate of laying is happened between 10 and 12 h in the morning.
Key words: rhythm of laying, laying intervals, eggs production, layer hens.

- 2) Любомир Лашев, **Радослав Михайлов**, Валентина Лашева, 2013, “Хематологичен профил на пауни отглеждани в България”, Животновъдни науки, 6, 100-102, ISSN : 0514-7441

Abstract: In the present paper are presented results from standard hematological studies on clinically healthy adult male and female peacocks. Studied were 36 adult peacock - *Pavo cristatus* of both sexes - 17 females and 19 males reared in aviaries at different farms as small groups of 3 to 9 birds. Mean values of the investigated parameters are as follows: red blood cells - 3.48 ± 0.35 10¹²/l, hemoglobin - 10.81 ± 1.35 g/l, white blood cells - 30.52 ± 3.07 10⁹/l, lymphocytes - $47.5 \pm 3.07\%$, heterophils - $46.7 \pm 3.05\%$, eosinophils - $3.44 \pm 0.35\%$, monocytes - $0.5 \pm 0.5\%$, basophils - $1.21 \pm 0.2\%$. They are different from the published for wild peacocks, reared in India and close to the found for pheasants and various breeds of domestic fowl. The hemoglobin values are lower but total number of white blood cells is significantly higher, compared to the reported for wild peacocks in India. The ratios of the different classes are similar. In the values of the hematological parameters studied no gender related differences were found. Standard blood values of peacocks reared in aviaries in the climate of Bulgaria are close to the values typical of other species of Phasianidae. There are no clear gender differences.

- 3) Румен Бинев, **Радослав Михайлов**, Красимира Узунова, Иван Вълчев, 2013, „Проучвания върху някои форми на стереотипни (психични) нарушения при зоопаркови животни”, Научни трудове на Русенския Университет, том 52, серия

1.1, 72-76, ISSN 1311-3321 (print), ISSN 2535-1028 (CD-ROM), ISSN 2603-4123 (online)

Abstract: Studies upon some forms of stereotypical (psychological) disorders in zoo animals: Within 5 years (2008 to 2012) were performed observations of animals from Zoo, Stara Zagora. The aim of this study was to specify different manifestations of behavioral (stereotypical) disorders in wild animals in Zoo conditions. In addition, studied the causes and outlines measures to prevent abnormal behavioral activities. It was found that the most commonly found abnormal locomotor activities. Separation from their natural environment and the lack of incentives for zoo animals are the most common causes for the occurrence but stereotypical disorders.

- 4) **Михайлов, Р.**, Димитров, Р., Стаматова-Йовчева, К., Йовчев, Д., Радев, В., Славов, Т., 2014. Сравнително морфометрично изследване на скелета на главата при някои видове от сем. Canidae в България, Екология и бъдеще, ГОД. XIII, No. 1–2: 12-21, Научно списание за селскостопанска и горска наука, ISSN 1312- 0751.
- Abstract:** We performed craniomorphometrical analysis of the head skeleton (skull) in 24 mature animals, possessed of four (4) species from family Canidae. The skulls were parts from the osteological collections. Methods: The studied eleven parameters were presented by native figures and X-ray images. The results were processed by variable statistical analysis. The longest measurements of the head skeleton (skull) were determined. Results: Condilobasal length showed lower absolute measurements compared to the biggest length of the head skeleton. The dorsal length of the brain skeleton of the wolf was 55.9%, in the dog – 56.4%, in the jackal – 55.5%, and in the fox – 54.2% of the biggest length of the head skeleton. The basal length of the brain skeleton showed lower absolute measurements compared to the dorsal length of the brain (cranial) skeleton. The dorsal length of the facial skeleton was with lower measurements compared to the dorsal length of the brain skeleton. The wolf's and jackal's zygomatic width was 55.8% of the biggest length of the head skeleton, the dog's – 55.1% and the fox's – 54.2%. The internal length of the brain (cranial) cavity was 46% from the biggest length of the head skeleton of the wolf, 44.1% of the dog, 48.7% of the jackal and 45.8% of the fox. The height of the brain (cranial) skeleton was 29% of the biggest length of the head skeleton of the wolf, 30.5% of the dog, 30.9% of the jackal and 28% of the fox. The brain skeleton volume was greatest in the wolf and smallest in the fox. Conclusion: The volume-body coefficient (VBW) is an indirect indicator for the relative size of the brain, as it was highest in the fox and lowest in the dog. The obtained X-ray images demonstrated the investigated by us craniological markers and could be used for the craniomorphometric characteristics of the studied species. Our results and the published information from many authors motivate us to purpose, that the animals with greater size of brain cavity volume, respectively with greater cerebrum adapt better. Therefore, we could support the theory of connection between the size of the brain and the survival of the mammals in new environment.

- 5) **Р. Михайлов**, Р. Димитров, К. Стаматова-Йовчева, В. Радев, 2014. Случай на язвена болест при огърлично пекари (*Pecari tajacu*). Екология и Бъдеще, Год. XIII, No. 3 Научно списание по екология и околна среда Scientific Journal of Ecology and Environment, vol. XIII, No. 3, 76-80, ISSN 1312- 0751.

Abstract: The clinical case concerned a female collared peccary from Zoo in Stara Zagora, at the age of 10 years with body weight of 18 kg. Peccary demonstrated variable appetite, weight loss, kyphosis, musculoskeletal instability, anorexia and recumbency. Single ulcerative defects were observed in the squamous portion of the gastric mucosa, in the area of the gastric pouch. The ulcers were oval erosive defects, which were well defined by the close soft tissues by whitish shaft. The mucosal surface of the gastric pouch had multiple oval nodes. The some stress factors, according to us, have influenced disease manifestation.

- 6) **Р. Михайлов**, Р. Димитров, К. Стаматова-Йовчева, Д. Йовчев, Ст. Стоянов, 2014. Сравнително морфометрично изследване на скелета на главата при някои видове от сем. Suidae. Животновъдни науки, 3: 22-30, ISSN : 0514-7441.

Abstract: The aim of the study was to make a comparative craniological analysis of wild and domestic swine and warthog. We investigated the head skeleton of 27 individuals belonging to 3 animal species of family *Suide* - wild swine (*Sus scrofa scrofa*), domestic swine (*Sus scrofa familiaris*) and warthog (*Phacoecherus africanus*). The values of 9 craniological parameters, were determined. In domestic swine's the head skeleton was shorter, compared to the wild swine and warthog. Domestic swine's condylobasal length was the greatest. The facial skeleton was more developed than the brain one that proves thesis that face's shortening is connected with adaptation to predation. Wild swine's head skeleton shape differed to this of domestic swine and warthog. Greater height of domestic swine's brain cranium was resulted by the fact that its frontal bones are not plate and they form an angle along them. The brain cavity's volume is the greatest in the wild swine, which probably is an advantage for mammal's surviving.

- 7) **R. Mihaylov**, R. Dimitrov, 2015, Comparative weight and metric traits of intestines in Japanese quails (*Coturnix coturnix Japonica*), common quails (*Coturnix coturnix*, Lineus, 1758) and their hybrids. International Journal in Physical & Applied Sciences, 02, (05): 33-38, ISSN: 2394-5710.

Abstract: A total of 26 quails (9 Japanese quails, 9 common quails and 8 Japanese females × common males hybrid quails) were studied. The individual live weight of birds was determined, as well as the weights of the duodenum, jejunum, ileum, caeca and rectum (g), and the length of these segments (cm). Data was statistically processed. The absolute and relative weights of intestinal segments were the highest in Japanese quails, followed by hybrid quails and the lowest – in common quails. In the three studied types of quails, the jejunum had the highest absolute and relative weight among intestinal segments, followed by the duodenum. The relative duodenal weight in the

wild quail was by about 8.3% higher than in Japanese quails. A marked difference was also detected in caeca – their relative weight in Japanese quails was by 6.5% higher than in common quails. The highest absolute and relative length among all intestinal segments was that of the jejunum. The relative length of the duodenum in common quails was by 9% higher than in Japanese quails. The L/m index of the entire intestinal tract was the highest in wild quails, followed by hybrids and Japanese quails. In our belief, the common quail attains its ultimate body weight with relatively thinnest intestinal wall which indicated its higher functional activity as compared to the other studied groups of birds.

- 8) **R. Mihaylov**, R. Dimitrov, V. Radev, 2015, Cases of animal escapes from zoos. *International Journal in Physical & Applied Sciences*, 2, (06): 40-45, *ISSN: 2394-5710*.
Abstract: The zoo area, zoo park, menagerie or simply the zoo is a series of spaces with constructed facilities, in which the animals are allowed to reproduce. We set the following goal: study the cases of animal escapes from Bulgarian zoos. The research was conducted within the territory of the zoo in the city of Stara Zagora for the period from 20 May 2005 to 20 February 2015. Escapes of animals beyond the enclosures occur in all zoos for various reasons. The Stara Zagora zoo is no exception. This case made it clear to us that the animals take advantage of the imperfections of the enclosures. This is proof of the active thought processes in animals and the way the mistakes done by people while placing the fences can be taken advantage of.
- 9) **Р. Михайлов**, Р. Димитров, Б. Михайлов, Т. Славов, 2015, Спасяване на животни попаднали в беда и неестествена среда, *Животновъдни науки*, ЛП (52), 4: 85-90, *ISSN(print) 0514-7441 ISSN(online) 2534-9856*.
Abstract: The history of six cases of animals in trouble or unusual environment – two dogs, a swan, two cows and a bear – is described. The analysis of rescue activities demonstrated that in the Republic of Bulgaria, there is no competent state or local structure engaged with rescue of animals in trouble or atypical environment. The experience of people charged with these activities until now could be used for training of the staff of a future similar organization or animal police.
- 10) **Р. Михайлов**, Р. Димитров, К. Узунова, И. Върляков, М. Халил, И. Хубенова, 2015. Състояние на безстопанствената кучешка популация на територията на община Стара Загора. *Животновъдни науки*, 52, (6): 80-84, *ISSN(print) 0514-7441 ISSN(online) 2534-9856*.
Abstract: The present status of the stray dog population at the territory of the Stara Zagora municipality and the work of the municipal stray dog kennel have been evaluated. A complete hygiene assessment of all elements related to the environment of dogs was performed. It was found out that stray dog population in the municipality was not reduced due to the occurrence of so-called “pseudo home-owned dogs” which are not registered by the owners as required by the legislation. Two primary reasons for the failure of the stray dog problem solution were identified. The pseudo home-owned dog

category is a permanent source for stray dogs. The occurrence of stray dogs is attributed to lack or poor control from the part of an authorized structure.

- 11) **R. Mihaylov**, R. Dimitrov, R. Binev, R. Vasilev, B. Mihaylov, Fejzullah Fejzulla, 2016. Reasons for escape of animals from zoos. *International Journal in Physical & Applied Sciences*, 03, (08): 1-11, *ISSN: 2394-5710*.

Abstract: Escape of animals from zoos are threatening factors to the public. The aim of the study is to carry out analysis of the presented facts and investigation of the circumstances and reasons for escape of animals from zoos in Bulgaria. The investigation was conducted on the territory of the city zoo Stara Zagora. Materials from personal archives, opinions of experts from zoo and publications were used. Methods of interviewing of officials and eyewitnesses of the incidents were applied and photo documentation of the cases. Animals in zoos take advantage of opportunities to escape because some facilities in zoos are not consistent with the biology of the inhabitants. The main reason for animals' escape is the human mistake. In some single cases of escapes, the animals were killed because they represented serious threat to the society.

- 12) R. Binev, I. Valchev¹, **R. Mihaylov**, Y. Nikolov, 2016, "Investigations on some chemical indices in blood of quails (*Coturnix coturnix*) after experimental acute intoxication with the carbamate insecticide carbofuran", *International Journal in Physical & Applied Sciences*, IJPAS Vol.03 Issue-12, *ISSN: 2394-5710*.

Abstract: Experiments for monitoring of changes in blood levels of some chemical indices were carried out in quails (*Coturnix coturnix*) after acute intoxication with the carbamate insecticide carbofuran (Carbosan 35 CT).

The studies involved one control and 4 experimental groups of quails. They were treated orally by increasing single doses of the tested pesticide via oesophageal probe: 1.05 mg/kg (experimental group I), 2.1 mg/kg (experimental group II), 5.25 mg/kg (experimental group III) and 10.5 mg/kg (experimental group IV), corresponding to 1/10 LD₅₀, 1/5 LD₅₀, 1/2 LD₅₀ and LD₅₀ –oral doses for albino rats, respectively. In 3 consecutive days prior to the treatment (hours –48, –24 and 0) and on posttreatment hours 1, 3, 5, 7, 24 and 48 hours from all groups there after were obtained blood samples from v. subcutanea ulnaris or v. metatarsea medialis for analysis of blood glucose, total bilirubin, total protein, cholesterol, triglycerides, creatinine and uric acid. It was established that the tested organocarbamate insecticide caused increased the levels of blood glucose, total bilirubin, total protein, cholesterol, triglycerides and uric acid.

- 13) **Радослав Михайлов**, Диан Канъков, Петя Бойкова, 2017, „Спасяване на животни – административни несъвършенства и действителни ситуации“, *Ветеринарна сбирка*, 7-8, 26-32, *ISSN 0205-3829, NRS-ID №3375*.

Резюме. По една или друга причина животните бягат или напускат районите на обитаване или парковете, в които биват отглеждани. През последните

десетилетия се наблюдава засилен обществен интерес и съпричастност към причините, водещи до бягство на животни и процесите по тяхното спасяване, а така също и по отношение спасяване на животни - подложени на стрес и тормоз. Тези въпроси са обект на жив интерес и от страна на българската общественост. В някои държави (Австралия, САЩ, Великобритания и др.) дейностите по залавяне на избягали, изгубени и попаднали в беда животни се осъществяват от специалисти с професия или като част от обхвата на работата на зоополицията. Независимо как законово са регламентирани тези действия, дали те са свързани със спасяване на животни при бедствени ситуации или се касае за залавянето на диви животни, открити във фермите или в домовете на хората - за правилното и успешно протичане на такава акция съществуват задължителни условия, които трябва да бъдат спазени: спасителните екипи да са преминали специализирана подготовка; да е изготвен план за действие - съобразен с теренните условия, вида на животното и предварително да бъдат набелязани възможните рискове; ясна координация в действията между институциите, неправителствените организации и гражданското общество.

Abstract: For one reason or another, animals escape or leave the habitats or parks where they are kept. In recent decades, there has been an increased public interest and sympathy for the reasons leading to the escape of animals and the processes of their rescue, and also regarding the rescue of animals - subjected to stress and harassment. These issues are also of keen interest on the part of the Bulgarian public. In some countries (Australia, USA, Great Britain, etc.) the activities of capturing escaped, lost and distressed animals are carried out by specialists by profession or as part of the scope of work of the zoo police. Regardless of how these actions are legally regulated, whether they are related to rescuing animals in disaster situations or it concerns the capture of wild animals found on farms or in people's homes - for the proper and successful conduct of such an action there are mandatory conditions that must be observed: the rescue teams have undergone specialized training; that an action plan has been drawn up - in accordance with the field conditions, the type of animal and that the possible risks have been identified in advance; clear coordination of actions between institutions, non-governmental organizations and civil society.

- 14) **R. Mihaylov**, R. Dimitrov, R. Binev, K. Stamatova-Yovcheva, 2017. A study of some biological, anatomical and related environmental features of Nutria /*Myocastor coypus*/ from the territory of Stara zagora region. MAE Vet Fak Derg., 2 (1): 7-15, ISSN 2458-9268, E-ISSN 2148-6239.

Abstract: The nutria (*Myocastor coypus*) belongs to the class of Mammals, Rodents order, family Myocastoridae. It leads a semiaquatic lifestyle and can be seen around rivers, lakes and marshes. Nutria is the biggest rodent in Bulgaria. It lives mainly along the rivers of southeastern Bulgaria. The animal's body is cylindrical in shape, with relatively large head and short ears. The peak of the face is blunted with clearly visible teeth, colored in bright orange. Nutrias are mostly herbivores. Their role is to spread diseases such as equine encephalomyelitis, leptospirosis, hemorrhagic septicemia (Pasteurellosis), paratyphoid and salmonellosis. The aim of the study is to examine the impact of nutria on the environment on the territory of Stara Zagora region, and some of its biological and anatomical features. In some territories of Stara Zagora were found traces of life activity of nutria, as entrances of shelters, footprints of thoracic and pelvic

limbs, and feces. Nutrias have not permanent habitats. In the study we found no evidence of damage on the environment. The study showed that the result of the vital activity of nutrias is rather positive, concerning the cleaning of the water areas of vegetation. We found that the thoracic and pelvic limbs have five fingers. The difference between the volume of the nutria cranial cavity and these of the jackal and fox is provoked by the differences in the type of their food and lifestyle.

- 15) Светлин Танчев, Станимир Димитров, Деяна Генчева, Светлана Георгиева, Георги Бонев, **Радослав Михайлов**, 2018, „Влияние на степента на инбридинг върху динамиката на фенотипните корелации между някои репродуктивни признаци при женски зайци (*Oryctolagus cuniculus*), Science & Technologies, volume VIII, №5: Veterinary Medicine, Animal Studies, 18-24, ISSN 1314-411.

Abstract: The influence of different degrees of experimental inbreeding ($F_x=0$, $F_x=0,125$; $F_x=0,25$; $F_x=0,375$; $F_x=0,5$; $F_x=0,625$) has been studied on the reproductive traits of 47 nrs. Californian rabbit does. Each animal was followed by 3 to 5 reproductive cycles and the present parameters: number of total born (TB), born alive (AB) and stillborn kits (SB), litter size on the 21st day (LS21) and litter size on the 41st day (LS41) post partum. Correlative and regression analyzes have shown a pronounced negative influence of high degrees of inbreeding on the reproductive qualities of does. Evidence of this was the calculated coefficients of phenotypic correlation between the studied reproductive parameters at different degrees of inbreeding, which with few exceptions were positive in the direction and in most cases significant and high in degree. Particularly significant in this respect were the negative regression coefficients obtained at the constant argument (x) - the level of inbreeding and the variable function (y) - each individual reproductive trait, which has confirmed again the negative influence of inbreeding depression on the studied traits.

- 16) K. Stamatova-Yovcheva, R. Dimitrov, D. Yovchev, D. Vladova, Omer Gurkan Dilek, **R. Mihaylov**, 2018. Histological definition for the gray scale ultrasonography of the rabbit liver. Vet. Hekim. Der. Derg., 89, (1): 32-41, ISSN: 0377-6395, e-ISSN: 2651-4214

Abstract: The aim of the present study is to prove that the morphological and histological features of the rabbit liver are base for the creation of proper anatomical US image. For the purpose, we use 12 clinically healthy New White Zealand rabbits. In the histological study, we use the routine staining with Hematoxylin/Eosin. The US study was carried out with ultrasonic equipment for 2D visualization. The US image of the rabbit liver was produced by the different acoustic impedance of the tissues, which composed the organ. The variability of the grey and white nuances when observing the anatomical US image of the rabbit liver is produced by its histological features. It is not relative to the orientation of the transducer to the field of study. There was a variability of the US acoustics of the liver at the same intensity of the US wave. This is also owing to the histological features of the liver and biliary ducts. US visualization of the rabbit liver is because of the dispersion character of the echo-signal, generated by parenchyma, perivascular connective tissue and extrahepatic biliary ducts. The

different acoustics of capsula fibrosa and liver parenchyma is related to the following US indices: brightness and contrast, in accordance to the greywhite scale, a variety of the grey nuance and speed of the US wave. We present the following conclusion: The US morphological character of the studied organ is defined by its histological features. These histological features of the liver could be accepted as “Golden standard”, because they define the US anatomical visualization of the organ.

- 17) Varlyakov, I., V. Radev, T. Slavov, K. Uzunova, **R. Mihaylov**, M. Toshevska, 2015, Changes in Blood Biochemical Indices in Yearling Rams after Dietary Supplementation of Optigen, Albanian J. Agric. Sci. 2015; 14 (1): 19-24. ISSN:2218-2020

Abstract: A physiological experiment was conducted to evaluate the effect of the technological product Optigen® supplemented to the feed of yearling rams at a dose of 12 g. The blood concentrations of glucose, creatinine, urea, total protein, albumin, globulins, and protein coefficient (albumin/globulin ratio) were assayed in samples collected from *v. jugularis*. A positive influence of Optigen was established, with maintaining higher blood glucose, creatinine and urea levels 2.5 h after feeding ($p \leq 0.05$). The increased total protein concentrations during the experimental period suggested for enhanced and stable rates of absorption from the digestive tract into the blood – effect of Optigen’s active principle. Higher albumin/globulin ratio ($p < 0.001$) was demonstrated, as a result of increased albumin levels especially at post feeding hours ($p < 0.001$) and the reduced blood serum globulins ($p < 0.05$). The supplementation of Optigen to the ration did not show any side or adverse effect on the health and welfare of experimental animals.

- 18) А. Генчев, Х. Луканов, **Р. Михайлов**, И. Павлова, „Цветовые характеристики скорлупы яиц эму (*Dromaius novaehollandiae*) в период инкубации“, 18-19 февраля 2021 г., 9-ю Международную научно-практическую конференцию «Сохранение разнообразия животных и охотничье хозяйство России». – Российский государственный аграрный университет - МСХА имени К.А. Тимирязева Всероссийский научно-исследовательский институт охотничьего хозяйства и звероводства имени проф. Б.М. Житкова, Московское городское общество охотников и рыболовов, Государственный Дарвиновский музей, Отделение «Охрана природы и биоразнообразия», 224-226, РАЕН, ISBN 978-5-9675-0548-5.

Abstract: Цель настоящего исследования проследить, в какой степени за период инкубации меняются цветовые характеристики скорлупы яиц эму (*Dromaius novaehollandiae*). Для исследования зоопарком г. Стара Загоры были предоставлены 34 шт. яиц эму. Все яйца были не старше 14 дней после кладки и до инкубации хранились острым концом вниз при температуре 16о С и 75% относительной влажности. Цветовой анализ скорлупы сделали в CIEL*a*b* системе (иллюминат D-65) при помощи спектрофотометра „PCE-CSM 2” при закладке яиц, на 7, 14, 21, 28, 35, 42 и 49 дней инкубации. Стоимости координат L*, a* и b* определили в трех зонах яйца – тупом и остром концах и экваториальной зоне яйца. На базе полученных стоимостей вычислили индекс

цвета скорлупы (SCI^* и SCI^{**}) по формулам: $SCI^*=(L-a-b)^*(-1)$ и $SCI^{**}=(L-C)^*(-1)$ (Lukanov et al., 2016; 2018).

14. 10. 2022 г.
Стара Загора

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