International Conference of Farm Animal Diversity
&
33rd Annual Meeting of the International Association for the Conservation of Animal Breeds in the Danube Region

Co-organized by the Faculty of Agriculture
and the Faculty of Veterinary Medicine, Trakia University

20-23 June 2024, Stara Zagora, Bulgaria

BOOK of ABSTRACT

ORGANIZERS

TRAKIA UNIVERSITY
STARA ZAGORA

100 years Faculty of Veterinary Medicine

DAGENE

TRAKIA UNIVERSITY
STARA ZAGORA

DAGENE

PROGRAMME OVERVIEW

THURSDAY 20 JUNE 2024 ACADEMIC INFORMATION CENTER

09:00 - 13:00	Registration of Participants
	HALL A
12:45 - 13:00	Opening Ceremony
13:00 - 14:30	Oral Section 1st Sessions, Veterinary sciences and One Health
14:30 - 15:00	Coffee Break
15:00 - 16:15	Oral Section 2nd Sessions, Food Science, Technology and Safety
16:30 - 18:00	Exhibition & Trakia University Tour
18:00 - 19:30	Welcome cocktail at Trakia Univerity

FRIDAY 21 JUNE 2024 ACADEMIC INFORMATION CENTER

09:00 - 13:00	Registration of Participants
	MAIN HALL ACADEMIC INFORMATION CENTER
10:00 - 12:30	Oral Section 3rd Sessions, Socioeconomics aspects for conservation of genetic diversity (DAGENE)
10:00 - 12:00	Oral Section 4th Sessions, Student Oral Presentation
12:30 - 13:30	Lunch
13:30 - 15:30	Oral Section 5th Sessions, Socioeconomics aspects for conservation of genetic diversity (DAGENE)
15:30 - 16:00	Coffee Break
16:00 - 17:00	Poster Section
16:00 - 17:00	DAGENE Board Meeting
17:00 - 17:15	Closing Ceremony
19:00	Conference Gala Dinner

TRAKIA UNIVERSITY
STARA ZAGORA

DAGENE

PROGRAMME OF ORAL PRESENTATIONS

THURSDAY 20 JUNE 2024 ACADEMIC INFORMATION CENTER

09:00 - 13:00 Registration of Particiapants

MAIN HALL ACADEMIC INFORMATION CENTER

1st Sessions, Veterinary Sciences and One Health
Chairman: Assoc. Prof. Dr Lazarin Lazarov

13:00 - 13:15 **Plenary Report: Uderstanding the importance of changes in honeybee populations and colony losses**
Ekin VAROL and Banu YÜCEL

13:15 - 13:30 **Validation and application of Reverse Transcription-nested PCR for detection of SARS-CoV-2/COVID-19 in cats and humans**
Ivo SIRAKOV, Nikolina RUSENOVA, Bilyana SIRAKOVA, Anton RUSENOV, Kalina SHISHKOVA

13:30 - 13:45 **Prevalence and antimicrobial resistance patterns of canine bacterial isolates from Bulgaria: a 5-year retrospective study (2019-2023)**
Velina DINKOVA, Vladimir PETROV, Nikolina RUSENOVA

13:45 - 14:00 **Artificial intelligence in veterinary medicine**
Nicoleta CIOCÎRLIE, Răzvan DOBRE

14:00 - 14:15 **Evaluation of early and advanced stages of acquired dental disease in pet rabbits: A case series**
Nazlı AYKOL and Murat ÇALIŞKAN

14:15 - 14:30 **Is the measurement of cortisol in animals only from body liquids?**
Sertel SEÇER, Erkan PEHLIVAN, Ciğdem ÜRKÜ

2nd Sessions, Food Science, Technology and Safety
Chairwoman: Assoc. Prof. Dr Nikolina Rusenova

15:00 - 15:15 **Egg production characteristics of some Bulgarian chicken breeds**
Hristo LUKANOV, Ivelina PAVLOVA, Atanas GENCHEV, Todor PETROV

15:15 - 15:30 **Cryotolerance of *Lactobacillus delbrueckii* subsp. bulgaricus strain**
Ivo GANCHEV

15:30 - 16:00 **Mineral composition of yoghurt from goat milk supplemented with Aronia fruit juice**
Mariya LAZAROVA

16:00 - 16:15 **Current status of aquaculture production in Türkiye. Role and importance of cooperatives in aquaculture production**
Kemal YILDIRIM, Özdal KÖKSAL, Sertel SEÇER

16:30 - 17:00 **Multiplier Event for the Results of the Erasmus+ Project "YEPTIM"**
Chairman: Dr Alexander ATANASOFF

16:30 - 17:00 **Exhibition: Veterinary anatomy: sceince & art**
Chairman: Dr Nikolay TSANDEV

TRAKIA UNIVERSITY
STARA ZAGORA

DAGENE

PROGRAMME OF ORAL PRESENTATIONS

FRIDAY 21 JUNE 2024 ACADEMIC INFORMATION CENTER

MAIN HALL ACADEMIC INFORMATION CENTER

3rd Sessions, Socioeconomics aspects for conservation of genetic diversity (DAGENE)
Chairman: Dr Hinrich MEYER-GERBAULET

10:00 - 10:15 **Plenary report: Past triumphs, present struggles, and future conservation challenges of the autochtonous sheep breeds**
Zsolt BECSKEI, Elmin TARIĆ, Sara ČOLOVIĆ András GÁSPÁRDY, Snežana PASKAŠ, Jovan BOJKOVSKI, Mariya LAZAROVA, Mila SAVIĆ

10:15 - 10:30 **Maternal genetic diversity of the red-faced sheep of Covasna based on the mtDNA control region**
András GÁSPÁRDY, Enikő MÁTYÁS, Péter HUDÁK, Zsombo WAGENHOFFER, Ákos MARÓTI-AGÓTS

10:30 - 10:45 **Stallion utilization in the Hungarian Hucul population**
Eszter STEIB and János POSTA

10:45 - 11:00 **The endangered indigenous breed – the Drežnica goat as a symbol of local identity in Slovenia**
Metka ŽAN, Barbara SOSIČ, Simon HORVAT

11:00 - 11:15 **Exploring the genetic diversity of sheep using mitochondrial DNA**
Edina KÁRPÁTI, András GÁSPÁRDY Zsombor WAGENHOFFER, László GULYÁS

11:15 - 11:30 **Some conformation information of a native pigeon breed: Satu Mare Tumbler**
Roland JUHOS and János POSTA

11:30 - 11:45 **Cryopreserved sperm quality in Tsigai Sheep: Implications for biodiversity protection**
Andrea SVORADOVÁ, Jakub VOZAF, Rastislav JURČÍK, Andrej BALÁŽI, Jaromír VAŠÍČEK, Peter CHRENEK

11:45 - 12:00 **Mitochondrial diversity and phylogenetic relationship of eight native Bulgarian sheep breeds**
Georgi KALAYDZHIEV, Nadezhda PALOVA, Georgi YORDANOV, Petar HRISTOV, Georgi RADOSLAVOV

5th Sessions, Socioeconomics aspects for conservation of genetic diversity (DAGENE)
Chairman: Assoc. Prof. Dr András GÁSPÁRDY

13:30 - 13:45 **Plenary report: Bulgarian poultry genetic resources**
Ivelina PAVLOVA

13:45 - 14:00 **Phylogenetic research of the Hungarian Grey cattle on a full representative research sample**
Ákos MARÓTI-AGÓTS, Balázs KEMÉNY Zsombor WAGENHOFER, Csilla JÓZSA, Endre KALTENECKER András GÁSPÁRDY

14:00 - 14:15 **Genetic structure of Pannon rabbit breeds**
János POSTA, Zsolt MATICS, Zsolt GERENCSÉR

14:15 - 14:30 **Researches of the wild boar population (*Sus scrofa*) Timis county, Romania**
Eugen Catalin ZOICANE and Marcel MATIUTI

14:30 - 14:45 **Autochthonous and local horse breeds in Bulgaria**
Nadejda LUKANOVA

14:45 - 15:00 **Key points for a national plan to save the indigenous Bulgarian East Balkan pig breed threatened with extinction**
Dobry YARKOV, Ilyian KOSTOV, Dafinka GROZDANOVA, Hinrich MEYER-GERBAULET

10:00 - 11:00 **Sponsored Seminar of Eville & Jones UK**
Chairman: Dr Gancho CHAKOV, Tech Manager

4th Sessions, Student Oral Presentation
Chairman: Assoc. Prof. Dr Tsvetoslav KOYNARSKI

11:00 - 11:15 **Project "ROSS"**
Siliya IVANOVA and Ivana TODOROVA

11:15 - 11:30 **Plastination of cross sectioned horse penis for anatomical evaluation**
Melis DEMIRCI, Barış BATUR, Caner BAKICI, Hasen Awel YUNUS,

11:30 - 11:45 **Polyester plastination: A practical tool for investigating sheep stomach anatomy**
Doğa ORHAN, Barış BATUR, Caner BAKICI, Hasen Awel YUNUS, Nikolay TSANDEV

11:45 - 12:00 **Acute kidney injury (AKI) in horses: diagnosis and therapeutic approach**
Adelina KARASTOEVA and Sasho SABEV

12:15 - 12:30 **Comparative visual analysis among corrosion casts and 3D printed models of the vascular system of the heads of domestic swine**
Nikolay TSANDEV, Hristiyana HRISTOVA, Caner BAKICI

12:30 - 12:45 **Effect of probiotics administration on health and live weight of broiler chickens**
Ivan BOGDANOV and Lazarin LAZAROV

13:00 - 15:00 **Workshop – Feed Samples EU152/2009**
Chairman: Atanas BOZHKOV, CEO of BFMA

PROGRAMME OF POSTER PRESENTATIONS

1. **The importance of nutrition and the use of anti-inflammatory drugs in the treatment of dermatitis in carnivores**
   Ionuț Răzvan DOBRE and Nicoleta CIOCÂRLIE
2. **Retroperitoneal pendulans and obturating fibroma in a dog (Golden Retriever) – A clinical case**
   Ismet KALAKANOV and Ivelina GROZEVA
3. **Growth performance of common carp (*Cyprinus carpio*) co-cultivated with lettuce (*Lactuca sativa*) in a closed-loop aquaponic system: Effects of insect meal, insect frass, and hydroponic by products**
   Athanassios STAMELOS, Athanassios LATOOS, Petros PAPAKYRIAKIDIS, Nikos VLACHOS, Ioannis KARAPANAGIOTIDIS, Panagiotis BERILLIS, Efi LEVIZOU, Christos ROUMBOS, Christos ATHANASSIOU, Dimitrios KARAGIANNIS, Lambros KOKOKIRIS, Eleni MENTE
4. **A tri-trophic production system of red tilapia fed on insect meal co-cultivated with cucumber: The effect of production system on water quality and biomass production**
   Anastasia MOURANTIAN, Maria CHATZINIKOLAOU, Sofia FALIAGKA, Christos ATHANASIOU, Ioannis KARAPANAGIOTIDIS, Lambros KOKOKIRIS, Eleni MENTE, Nikos KATSOULAS, Efi LEVIZOU
5. **Closing the loop: Inclusion of hydroponic by products into the diet of *Hermetia illucens* larvae produced as aquafeed ingredient for aquaponics**
   Andreas KOLORIZOS, Christos RUMBOS, Christos ATHANASIOU, Ioannis KARAPANAGIOTIDIS, Lambros KOKOKIRIS, Eleni MENTE
6. **Comparative measurements of surface body temperature of Balkan donkeys using infrared thermography**
   Petar STAMBEROV, Kalin HRISTOV, Aleksandar STOIMENOV, Victoria MARINCHEVA, Mina-Maria MARINOVA
7. **Genetic characterization of lipizzan breed using pedigree information**
   Máté KOVÁCS, Sándor MIHÓK, János POSTA

PROGRAMME OF STUDENT POSTER PRESENTATIONS

SP1. Unlocking the potential of Immunobeta®: A promising immunomodulator for enhancing humoral immune factors in rainbow trout
Neven TERZIEV, Tsvetoslav KOYNARSKI, Sertel SEÇER

SP2. The effects of stocking density on certain acute phase proteins and corticosteroid stress hormone in African catfish (*Clarias gariepinus*) reared in RAS with low-water exchange
Veselin PENEV, Atanas BOZHKOV, Dimitrinka ZAPRYANOVA, Ciğdem ÜRKÜ, Galin NIKOLOV

SP3. First study on the sperm production of boars from the East Balkan Pig
Angel MAVROVSKI, Rusko PETROV, Nadezhda KARASTOYANOVA, Radka MALINOVA, Martin IVANOV, Dobry YARKOV

SP4. Lipid and mineral profile studies in ewes with ketosis
Vania MARUTSOVA and Petar KAVARDZHIEV

Understanding the Importance of Changes in Honeybee Populations and Colony Losses

VAROL, Ekin[1*o] - YÜCEL, Banu[1]

[1]Ege University, Faculty of Agriculture, Department of Animal Science, 35100 Izmir, Turkiye

[*]Ekin VAROL, corresponding author
[o] Ekin VAROL, presenter

Abstract

Honeybees are the creatures that have critical importance in the ecosystem. In addition to producing bee products that are widely used in human food and health but also their contribution to pollination ensures the preservation of the natural balance. Environmental changes, pollution, exposure to pesticides, global climate change, and errors in management affect both honeybees living in hives and those living in the wild, causing a decrease in their numbers and causing the loss of genetic diversity. Due to their phytogeographical features, the Balkan geography and Türkiye have an important place and role in terms of beekeeping. Besides, in recent years, honeybee populations have been in a serious decline, a phenomenon known as CCD (Colony collapse disorder). It is crucial to understand the status and losses of bee populations in this region and the effects on these species and ecotypes to take steps to protect honeybees, which are very valuable creatures for humanity and ecosystem.

Keywords: Honeybees, Beekeeping, Environment, Colony losses

Validation and Application of Reverse Transcription-nestedPCR for Detection of SARS-CoV-2/COVID-19 in Cats and Humans

SIRAKOV, Ivo[1*o] - RUSENOVA, Nikolina[2] - SIRAKOVA, Bilyana[3,4] - RUSENOV, Anton[5] - SHISHKOVA, Kalina[6]

[1] Medical University of Sofia, Medical Faculty, Department of Medical Microbiology, 1431 Sofia, Bulgaria
[2] Trakia University, Faculty of Veterinary Medicine, Department of Veterinary Microbiology, Infectious and Parasitic Diseases, 6015 Stara Zagora, Bulgaria
[3] Medical University of Sofia, Faculty of Dental Medicine, 1431 Sofia, Bulgaria
[4] AIPPMPDM, Ltd., 2800 Sandanski, Bulgaria
[5] Trakia University, Faculty of Veterinary Medicine, Department of Internal Medicine, 6015 Stara Zagora, Bulgaria
[6] University of Sofia, Faculty of Biology, Laboratory of Virology, 1164 Sofia, Bulgaria

[*]Ivo SIRAKOV, corresponding author
[o] Ivo SIRAKOV, presenter

Abstract

The SARS-CoV-2 pandemic has posed challenges to disease diagnosis and the detection of the virus as its causative agent. Consequently, various testing methods have emerged, both indirect and direct. Early in the pandemic, we developed a conventional RT-nestedPCR theoretically, which was later validated and applied for virus detection. Initially, we tested it in cats and subsequently in humans. To validate the RT-nestedPCR method, we used 45 positive and 45 SARS-CoV-2 negative human samples confirmed by an IVD test. Our method demonstrated 100% specificity and sensitivity, capable of detecting viral RNA in quantities as low as 0.015 ng/µL. The method was then applied to detect the virus in both cats and human samples. The developed and applied RT-nestedPCR underscores the reliability of the laboratory-developed methods, facilitating rapid responses at lower costs during pandemic situations.

Keywords: COVID-19, One Health, nestedPCR, Validation

Prevalence and Antimicrobial Resistance Patterns of Canine Bacterial Isolates from Bulgaria: a 5-year Retrospective Study (2019-2023)

DINKOVA, Velina[*] [o] - PETROV, Vladimir - RUSENOVA, Nikolina

Trakia University, Faculty of Veterinary Medicine, Department of Veterinary Microbiology, Infectious and Parasitic Diseases, 6015 Stara Zagora, Bulgaria

[*] Velina DINKOVA, corresponding author
[o] Velina Dinkova, presenter

Abstract

Dogs are increasingly recognised as reservoir for antibiotic resistant microorganisms. This retrospective study aimed to investigate the microbial pathogens associated with infections in dogs on the basis of 896 swab samples examined in the microbiological lab to the University Veterinary Hospital, Stara Zagora during 2019-2023, and to determine their antimicrobial drug resistance with emphasis on multidrug-resistant strains. The proportion of *Staphylococcus* spp., in particular that of ear and skin isolates increased progressively during the study period. Almost half of isolated *Staphylococcus* spp., were from skin lesions, followed by otitis externa and surgical infections. The major part of *Streptococcus* spp. was isolated from ears, eye and skin samples. About two-third of Gram-negative pathogens (mainly *E. coli*, *Proteus* spp. and *Pseudomonas* spp.) were isolated from ear and skin samples; their relative proportion increased gradually with years. The percentage of *Staphylococcus* spp. resistant against tested aminoglycosides was almost unchanged with years, whereas that to some cephalosporins tended to increase. The results confirm the importance of regular monitoring of the spread of canine bacterial strains due to the risk of zoonotic transmission.

Keywords: Canine isolates, Skin, Otitis, Antimicrobial resistance

Artificial Intelligence in Veterinary Medicine

CIOCÎRLIE, Nicoleta[*o] - DOBRE, Ionuț Răzvan

University of Agricultural Sciences and Veterinary Medicine Bucharest, Faculty of Veterinary Medicine, 050097 Bucharest, Romania

[*] Nicoleta CIOCÎRLIE, corresponding author
[o] Nicoleta CIOCÎRLIE, presenter

Abstract

The development of Artificial Intelligence (AI) and digitalization in the veterinary profession, although lagging behind human medicine, promises a certain revolution in the profession whether in data management, in diagnostic and treatment tools or in communication intra-clinical or with animal owners, the quality of care provided thus being greatly improved. The conducted study analyzes the perception of veterinarians towards the introduction and use of Artificial Intelligence, Digitization and Telemedicine in veterinary medicine. The answers to the questionnaires sent to the veterinarians from the academic environment and those from the veterinary practices were analyzed, making a separate analysis for the urban and rural veterinary practices. The veterinary profession will not disappear in the face of the digital boom, but it is definitely destined to change and AI and digitalization play a crucial role in this evolution of the profession with a positive contribution but also negative aspects.

Keywords: Veterinary practice, Veterinary medicine, Artificial Intelligence

Evaluation of Early and Advanced Stages of Acquired Dental Disease in Pet Rabbits: A Case Series

AYKOL, Nazlı - ÇALIŞKAN, Murat[*] [o]

Ankara University, Faculty of Veterinary Medicine, Department of Surgery, 06110 Ankara, Türkiye

[*]Murat ÇALIŞKAN, corresponding author
[o] Murat ÇALIŞKAN, presenter

Abstract

Acquired dental diseases and facial abscesses are common problem in pet rabbits. This is usually due to improper feeding practices. It is linked with diets that are low in fibre and potentially unbalanced. Insufficient chewing and lack of dental wear lead to overgrown teeth and malocclusion in pet rabbits. A total of 14 rabbits were included in the study. Male rabbits accounted for 79% (11/14) of cases, and 21% (3/14) were female. Age ranged from 8 to 102 months (median, 37 months), and body weight ranged from 1.8 to 5 kg (median, 2.7 kg). Lop-eared rabbit breeds were the most prevalent group of breeds diagnosed with odontogenic abscesses (4/14 [29%]). Other rabbit breeds commonly diagnosed with odontogenic abscesses included New Zeeland white rabbit (2/14 [14%]). Abscess resolution was achieved in 6 of 8 (75%) cases following treatment with the surgical tooth extraction and abscess excision technique. The rabbits treated with the marsupialization technique, abscess recurrence occurred in 2 patients about 2 month after the operation. It is thought that recurrence occurs in these patients due to advanced dental disease and osteomyelitis. The median disease-free time of rabbits was 152 days (45 to 420 days).

Keywords: Dental disease, Computed Tomography (CT), Rabbit

Is the Measurement of Cortisol in Animals Only from Body Liquid's?

SEÇER, Serte[lo] - PEHLIVAN, Erkan[2]* - ÜRKU, Çiğdem[3]

[1]Ankara University, Faculty of Agriculture, Department of Fisheries and Aquaculture, 06110 Ankara, Türkiye
[2]Ankara University, Faculty of Agriculture, Department of Animal Science, 06110 Ankara, Türkiye
[3] Istanbul University, Faculty of Aquatic Sciences, Department of Fish Diseases, 34134 Istanbul, Türkiye

[*]Erkan PEHLIVAN, corresponding author
[o] Sertel SEÇER, presenter

Abstract

Cortisol is a hormone secreted from the adrenal gland and is associated with the response of the organism to stress. Cortisol hormone can be measured from many body tissues/secretions such as blood, saliva, urine, faeces, hair, etc. depending on the species. Blood and saliva represent a relatively short period of time in which cortisol is released within a few minutes after a stressful stimulus, faeces and urine represent a longer cortisol circulation ranging from 2-48 hours, and hair represents months of cortisol accumulation. Therefore, depending on the material used to measure cortisol, the amount of cortisol secretion over different time periods can be measured. The matrices currently used for cortisol analysis in animals are traditionally blood serum and plasma, saliva, urine and faeces. In animals, matrices such as hair (fibre), nails, claws and fish scales are considered as new matrices for measuring stress. This presentation summarises the sampling and analysis of these different measurements of cortisol.

Keywords: Analysis, Cortisol, Measurement, Stress hormone

Egg Production Characteristics of Some Bulgarian Chicken Breeds

LUKANOV, Hristo[1*o] - PAVLOVA, Ivelina[2] - GENCHEV, Atanas[1] - PETROV, Todor[1]

[1]Trakia University, Faculty of Agriculture, Department of Animal Husbandry - Non-ruminants and Special Industries, 6015 Stara Zagora, Bulgaria
[2]Trakia University, Faculty of Veterinary Medicine, Department of Animal Husbandry, 6015 Stara Zagora, Bulgaria

[*]Hristo LUKANOV, corresponding author
[o]Hristo LUKANOV, presenter

Abstract

The aim of the study is to explore and analyze the egg productivity of some Bulgarian chicken breeds: Rodopska sharena kokoshka (RPCh); Yugozapadno-balgarska kokoshka (SWBCh); Balgarski pevets (BL); Strumska kokoshka (SCh). Four groups of 20 birds from each breed were formed. The period of testing were from start of egg-laying until natural molting. Basic parameters related to egg productivity and its efficiency were studied. The RPCh group (157 days of age) was counted as the most early-maturated, and the SCh (250 days of age) group as the most late-maturing. The highest egg-laying capacity was recorded in group RPCh (223.9 eggs per Hen-Housed), followed by group BL (191.6 eggs), and with the lowest egg-laying capacity was SCh group (123.9 eggs). The eggs obtained from SCh group had the highest average weight (57.96±0.54 g) and the eggs from SWBCh group had the lowest weight (50.94±0.68 g) ($P<0.05$). Of all tested Bulgarian chicken breeds with the greatest egg-laying potential is RPCh. Compared to other purebred hens, RPCh shows very good performance in terms of age at maturity, number of eggs laid per productive period and egg weight obtained.

Keywords: Egg production, Egg weight, EPEI, Feed Conversion Ratio

Cryotolerance of *Lactobacillus delbrueckii* subsp. Bulgaricus Strain

GANCHEV, Ivo[*o]

Trakia University, Faculty of Technics and Technologies, Department of Food Technologies, 8602 Yambol, Bulgaria

[*]Ivo GANCHEV, corresponding author
[o] Ivo GANCHEV, presenter

Abstract

In this work, the protective capacity of *Spirulina platensis* biomass in the preservation of *Lactobacillus delbrueckii* subsp. bulgaricus CFL1 was evaluated. *Lactobacillus bulgaricus* was freeze-dried in the presence of *Spirulina platensis* biomass. The aim of this work was to investigate the effect of fermentation pH and time on the acid tolerance, glycolytic activity, and survival during freeze drying of *L. delbrueckii* subsp. bulgaricus CFL1. The freeze-dried samples were stored at 5 and 25 °C for different periods of time. After desiccation, freeze-drying or storage, samples were rehydrated and bacterial plate counts were determined. According to the results obtained, *Spirulina platensis* biomass assays demonstrated to be highly efficient in the preservation of *L. bulgaricus*. The higher content of *Spirulina platensis* biomass in the commercial products was correlated with their higher protective capacity. During the study, when the fermentation process is carried out at a constant pH, a higher value of glycolytic activity is established in the cells of the probiotic culture, which decreases when the pH is lowered. Cell survival rate of *L. delbrueckii* subsp. bulgaricus CFL1 after lyophilization shows similar values after cultivation for 25 and 37 h ($p<0.05$), while the opposite dependence is established in experiments related to changes in the pH of the cultivation medium. The pH and fermentation time significantly influence the glycolytic activity of *L. delbrueckii* subsp. bulgaricus CFL1 and on the resistance of its cells to acid stress and lyophilization conditions. *Spirulina platensis* biomass was widely known by their prebiotic properties. However, their role as protective molecules have not been reported nor properly explored up to now. In this work the protective capacity of *Spirulina platensis* biomass in the preservation of *L. bulgaricus*, a strain particularly sensitive to any preservation process, was demonstrated.

Keywords: *L.delbrueckii* subsp. bulgaricus CFL, Lyophilization, Acid tolerance, Algae-based media

Mineral Composition of Yoghurt from Goat Milk Supplemented with Aronia (*Aronia melanocarpa*) Fruit Juice

LAZAROVA, Mariya[*o]

Trakia University, Faculty of Agriculture, Department of Animal Husbandry - Ruminants and Animal Product Technologies, 6015 Stara Zagora, Bulgaria

[*]Mariya LAZAROVA, corresponding author
[o] Mariya LAZAROVA, presenter

Abstract

The aim of our study was to determine the changes in content of some minerals in goat milk before and after fermentation, and respectively in plain and enriched with 3% cold-pressed Aronia (*Aronia melanocarpa*) fruit juice yoghurt, prepared from it. The quantity of minerals was determined by atomic absorption spectroscopy. In all of the samples-raw milk, plain and fortified yoghurt potassium was found to be main macro- and zink- main micro element. There were insignificant changes in mineral composition after fermentation with slight rise in calcium and decrease in manganese levels. All studied minerals showed growth in Aronia yoghurt, most prominent in the amounts of iron and manganese, which raised more than twice compared with the plain yoghurt. Least significant changes were observed in the levels of the most abundant minerals-calcium and potassium, while copper and zink showed an increase with about 25%.

Keywords: Yoghurt, Aronia juice, Minerals

Current Status of Aquaculture Production in Türkiye. Role and Importance of Cooperatives in Aquaculture Production

YILDIRIM, Kemal - KÖKSAL, Özdal - SEÇER, Sertel[*] [o]

Ankara University, Faculty of Agriculture, Department of Fisheries and Aquaculture, 06110 Ankara, Türkiye

[*]Sertel SEÇER, corresponding author
[o] Sertel SEÇER, presenter

Abstract

Aquaculture has played an important role in human history. With the increase in population, fishing has developed to provide nutritional needs. Aquaculture and fisheries in coastal regions and inland waters have great importance both in economic and nutrition aspects. Aquaculture has a critical significance with its share in national income, its role in industry, its contribution to trade and its potential to create employment. The study aims to contribute to the sector's sustainable growth by drawing attention to these problems. Fisheries cooperatives make an important contribution to the functioning of the fisheries sector and economic management. A survey was carried out in February-March 2024 with the Presidents of 10 fishery cooperatives operating in South Marmara. The survey revealed that co-operatives have problems such as financing, marketing, elderly members, youth apathy and climate change. Awareness, financial support and cooperation are necessary for cooperatives to operate effectively.

Keywords: Aquaclture, Fishery cooperative, South Marmara Sea

Past Triumphs, Present Struggles, and Future Conservation Challenges of the Autochthonous Sheep Breeds

BECSKEI, Zsolt[1]*[o] - TARIĆ, Elmin[1] - ČOLOVIĆ, Sara[1] - GÁSPÁRDY, András[2] - PASKAŠ, Snežana[3] - BOJKOVSKI, Jovan[4] - LAZAROVA, Mariya[5] - SAVIĆ, Mila[1]

[1]University of Belgrade, Faculty of Veterinary Medicine, Department of Animal Breeding and Genetics, 11000 Belgrade, Serbia
[2] University of Veterinary Medicine Budapest, Institute for Animal Breeding, Nutrition and Laboratory Animal Science, 1078 Budapest, Hungary
[3] University of Novi Sad, Faculty of Agriculture, Department of Animal Science, 21000 Novi Sad, Serbia
[4] University of Belgrade, Faculty of Veterinary Medicine, Department of Diseases of Ruminants and Swines, 11000 Belgrade, Serbia
[5] Trakia University, Faculty of Agriculture, Department of Animal Husbandry - Ruminants and Animal Product Technologies, 6015 Stara Zagora, Bulgaria

[*] Zsolt BECSKEI, corresponding author
[o] Zsolt BECSKEI, presenter

Abstract

In past decades, due to industry and market preferences, local sheep breeds have been exposed to genetic erosion and extinction risk. According to the FAOs database, 26 sheep breeds are documented in Serbia. More than half of these are autochthonous breeds/types (Sjenica, Svrljig, Pirot, Pirot Improved, Lipe, Vlashko-Vitoroga, Bardoka, Baura, Tsigai, Chokan Tsigai, Sharmountain, Karakachan, Krivovir, Vlasic), which have an aptitude for wool, meat, and milk production, as well as considerable historical and cultural heritage value. The analysis of the FAO statistical database and the National sheep yearbooks over a 20-year period reveals fluctuations in the population size of each native sheep breed/type. The risk level varies; some types are at high risk of extinction, while others are not at risk. Long-term supportive measures are deemed essential not only for economic reasons but primarily to ensure the survival of these breeds, reflecting their cultural, historical, and heritage value.

Keywords: Native sheep, Conservation, Risk status

Acknowledgments: The study was supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Contract number 451-03-66/2024-03/200143, TR31085).

Maternal Genetic Diversity of the Red-faced Sheep of Covasna Based on the mtDNA Control Region

GÁSPÁRDY, András[1]*[o] - MÁTYÁS, Enikő[2] - HUDÁK, Péter[2] - WAGENHOFFER, Zsombor[1] - MARÓTI-AGÓTS, Ákos[1]

[1] University of Veterinary Medicine Budapest, Institute for Animal Breeding, Nutrition and Laboratory Animal Science, 1078 Budapest, Hungary
[2] National Center for Biodiversity and Gene Conservation, Institute for Farm Animal Gene Preservation, 2100, Gödöllő, Hungary

[*] GÁSPÁRDY, András, corresponding author
[o] GÁSPÁRDY, András, presenter

Abstract

One of the variants of the Tsigai sheep is the reddish-headed and -legged, small sized, so-called Redface Covasna. In 2014, the Institute for Farm Animal Gene Preservation brought in a small herd of these from Transylvania with the aim of national conservation of the breed.
The aim of the study is to characterize the maternal background and maternal genetic diversity of the red-faced sheep of Covasna. For this, the nucleotide sequence of the control region (CR) of the mitochondrial genome (mtDNA) was used. The sampling was achieved from 34 individuals, 2021 and 2022.
The length of the aligned CR sequences is 621 bp with number of polymorphic base sites 88. The number of haplotypes is 30 (from haplogroups A and B, which proves its origin in Asia Minor). The value of haplotype diversity (Hd) is 0.991, and its variance is 0.010. The mean of the nucleotide diversity (π) and the average nucleotide difference per pair (k) in the investigated flock are 21.27*10-3 and 13.21, respectively. The value of the Tajima D test (-1.4427, $p > 0.10$) does not indicate a lack of alleles, nor does it indicate a narrowing of the genetic diversity occurring in the history of the population.

Keywords: Bimodal mismatch distribution, Maternal origin, Breed variant

Stallion Utilization in the Hungarian Hucul Population

STEIB, Eszter - POSTA, János*[o]

University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Animal Science, Biotechnology and Nature Conservation, Department of Animal Husbandry, 4032 Debrecen, Hungary

[*] János POSTA, corresponding author
[o] János POSTA, presenter

Abstract

Gene conversation for small populations requires a careful management of the available stallions. The aim of the study was to evaluate the mating records of the Hungarian Hucul stallions. The original dataset was supplied from the breeding organization. The mating records between 2000 and 2023 (3811 records) were taken into account in the current study. The genetic variability increased during the examined time period. All the seven stallion lines has been presented in the Hungarian breeding stock. Most stallions appeared from the Hroby line (19), while the least was presented from Polan (4) line. The number of covered mares showed quite similarly the same tendency. Surprisingly, proportion of mares covered by Gurgul stallions were less frequent than it was expected, and this ratio was higher for Prislop stallions than it could be expected.

Keywords: Hucul horse, Mating records, Stallion utilization

The Endangered Indigenous Breed – the Drežnica Goat as a Symbol of Local Identity in Slovenia

ŽAN, Metka[1*o] - SOSIČ, Barbara[2] - HORVAT, Simon[1]

[1] University of Ljubljana, Biotechnical Faculty, Department of Animal Science, 1000 Ljubljana, Slovenia
[2] Slovenian Ethnographic Museum, 1000 Ljubljana, Slovenia

[*]Metka ŽAN, corresponding author
[o] Metka ŽAN, presenter

Abstract

Historically, goat farming was an important economic activity and a significant source of income, especially for the inhabitants of the western part of Slovenia in the Julian Alps (Posočje). In this region, dairy cattle were predominant at middle altitudes, while goats were only kept in the higher mountain areas, where the steep and rocky mountain pastures were only suitable for goats. Over the centuries, this environment gave rise to the indigenous Slovenian goat breed, the Drežnica goat. Even today, the Drežnica goat is closely associated with traditional agricultural practices such as seasonal dairy farming, while the meat type of the Drežnica goat is characterised by an even more specific type of agricultural practise that is unique to Slovenia. In Slovenia, goat farming and grazing were often accompanied by legal restrictions in the past, which led to the depopulation of mountain villages and the transformation of the landscape. This study underscores the resilience of the Drežnica goat breed, highlighting its crucial role not only in sustaining biodiversity but also in maintaining the cultural and ecological heritage of the Posočje region.

Keywords: Drežnica goat, Restriction of goat breeding, Intangible cultural heritage

Exploring the Genetic Diversity of Sheep Using Mitochondrial DNA

KÁRPÁTI, Edina[1,2*o] - GÁSPÁRDY, András[2] - WAGENHOFFER, Zsombor[2] - GULYÁS, László[3]

[1] Széchenyi István University, Antal Wittmann Multidisciplinary Doctoral School of Plant, Animal and Food Sciences, 9200 Mosonmagyaróvár, Hungary
[2] University of Veterinary Medicine Budapest, Institute for Animal Breeding, Nutrition and Laboratory Animal Science, 1078 Budapest, Hungary
[3] Széchenyi István University, Albert Kázmér Faculty of Mosonmagyaróvár, 9200 Mosonmagyaróvár, Hungary

[*] Edina KÁRPÁTI, corresponding author
[o] Edina KÁRPÁTI, presenter

Abstract

Under today's prevailing economic conditions, the keeping of world breeds predominates. These animals are capable of excellent performance and produce efficiently and profitably. The more these breeds spread, the more native breeds are pushed out of breeding and public awareness. In the latter case, in addition to the decline in the number of those, perhaps an even greater problem is that without appropriate mating plan, their allele diversity will also decline, and they will fall into risk. The mitochondrial DNA (mtDNA)-based investigation is playing an increasingly important role in the genetic conservation of endangered domestic breeds. The authors aim to give an overview of the possibilities offered by this, with a special focus on sheep. After a general description of the mtDNA and it genes and their functions the specificity of the maternal lineages is presented. In this way, they inform the practical breeders to the promising potential of mtDNA for controlling the genetic diversity of endangered livestock breeds. All this not only preserves an essential part of our culture and history, but also contributes to sustainability.

Keywords: mtDNA, Genetic diversity, Gene conservation

Some Conformation Information of a Native Pigeon Breed: Satu Mare Tumbler

JUHOS, Roland - POSTA, János[*o]

University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Animal Science, Biotechnology and Nature Conservation, Department of Animal Husbandry, 4032 Debrecen, Hungary

[*] János POSTA, corresponding author
[o] János POSTA, presenter

Abstract

A total of 87 Satu Mare Tumbler pigeons from different sexes and color varieties were measured in the present study. Various phenotypic parameters (body length and weight, beak length, length and span of wing, body width, queue length, breast, feet and tight length) were measured and compared based on breeder, sex and color variety. Each factor was significant for body length and body width. Farm and sex were significant for length of wing, queue and feet. There was difference between sexes for body weight, span of wing and length of tight. Birds form the breeder 'Lupu' had usually higher values compared to the others. Higher values were found for cocks than for hens in each parameter. Reds had longer body, while yellows had longer beak. The span of wings was longer for dun color birds. Other values were higher for black birds.

Keywords: Satu Mare Tumbler, Pigeon, Conformation, Characterization

Cryopreserved Sperm Quality in Tsigai Sheep: Implications for Biodiversity Protection

SVORADOVÁ, Andrea[1,2*] - VOZAF, Jakub[3] - JURČÍK, Rastislav[1] - BALÁŽI, Andrej[2] - VAŠÍČEK, Jaromír[2,3] - CHRENEK, Peter[2,3o]

[1] NPPC, Research Institute for Animal Production, 95141 Nitra, Slovak Republic
[2] Mendel University in Brno, Faculty of Agri Sciences, Department of Morphology, Physiology and Animal Genetics, 613 00 Brno, Czech Republic
[3] Slovak University of Agriculture, Faculty of Biotechnology and Food Science, 94976 Nitra, Slovak Republic

[*] Andrea SVORADOVA, corresponding author
[o] Peter CHRENEK, presenter

Abstract

The objective of our research was to conduct a comparative analysis of cryopreserved sperm quality parameters of Tsigai (TS) sheep breed. Ejaculates (n=12) from TS sheep rams (n=2) were collected using electro-ejaculation. Samples were prepared from suitable ejaculates, ensuring at least 70% progressive motility. These samples were then equilibrated in Triladyl® diluent and subjected to automated freezing. Before freezing and after thawing, the sperm samples underwent assessments including motility (CASA), viability and apoptosis (DRAQ7/Yo-Pro-1), mitochondrial activity (MitoTracker), capacitation status (FLUO4), and acrosomal status (PNA). The results revealed significant differences ($P < 0.05$) in total motility between fresh (91.25±0.80%) and frozen/thawed (F/T) (41.14±12.04%) samples, as well as progressive motility between fresh (89.83±1.85%) and frozen/thawed (33.57±8.25%) groups. Moreover, significant differences ($P<0.05$) were also observed in the proportion of apoptotic spermatozoa (2.26±0.60%), dead (7.40±1.72%), mitochondrial active spermatozoa (84.52±5.60%) in fresh samples compared to F/T samples (12.34±0.80%; 46.59±2.82%; 47.71±4.04%). Our findings indicate that the selected cryopreservation protocol is relatively sufficient for the cryoconservation of sperm from Tsigai sheep breeds, since up to 50% of F/T sperm were motile and live. This has significant implications for biodiversity protection and simplifies the establishment of an animal genetic resources gene bank.

Keywords: Ram, Spermatozoa, CASA, Flow cytometry

Mitochondrial Diversity and Phylogenetic Relationship of Eight Native Bulgarian Sheep Breeds

KALAYDZHIEV, Georgi[1] - PALOVA, Nadezhda[2] - YORDANOV, Georgi[3]- HRISTOV, Petar[4]*- RADOSLAVOV, Georgi[4o]

[1] Trakia University, Faculty of Agriculture, Department of Animal Husbandry - Ruminants and Animal Product Technologies, 6015 Stara Zagora, Bulgaria
[2] Agricultural Academy, Scientific Center of Agriculture, 8300 Sredets, Bulgaria
[3] Executive Agency for Selection and Reproduction in Animal Breeding, 1766 Sofia, Bulgaria
[4] Bulgarian Academy of Sciences, Institute of Biodiversity and Ecosystem Research, Department of Animal Diversity and Resources, 1113 Sofia, Bulgaria

[*] Petar HRISTOV, corresponding author
[o] Georgi RADOSLAVOV, presenter

Abstract

The geographical, geomorphological, and climatic characteristics of Bulgaria are particularly favorable for animal breeding and, above all, for pastoral farming and sheep breeding. These conditions created prerequisites for the creation of about 30 unique local breeds of sheep. In this study we investigated the genetic diversity of eight of the most popular Bulgarian native breeds, based on the sequence analysis of a part of the mitochondrial D-loop region. An almost entire mitochondrial DNA (mtDNA) D-loop region (1180 bp) was amplified and sequenced. The obtained results showed the presence of a large number of haplotypes–225, belonging to two main haplogroups. The majority of samples showed a high prevalence of the European haplogroup B (95.2%) while the remaining individuals were assigned to haplogroup A (4.8%). None of the other reported mitochondrial haplogroups were observed. The number of polymorphic sites, nucleotide and haplotype diversity was high (240, 0.01237, and 0.9968, respectively), which is evidence for multiple maternal origins in all populations. The Tajima D-test value in all the study populations was −1.905 ($p < 0.05$), indicating that the abundance of rare alleles was most likely due to population expansion after a recent bottleneck. The Median joining network showed that almost all haplotypes belonging to haplogroup B formed a star-like network, which revealed a weak genetic differentiation and a large gene flow between the Bulgarian native breeds

Keywords: mitochondrial DNA, D-loop region, Genetic diversity, Phylogeny

Bulgarian Poultry Genetic Resources

PAVLOVA, Ivelina[*o]

Trakia University, Faculty of Veterinary Medicine, Department of Animal Husbandry, 6014 Stara Zagora, Bulgaria

[*]Ivelina PAVLOVA, corresponding author
[o] Ivelina PAVLOVA, presenter

Abstract

Genetic diversity of domestic chickens is increasingly shrinking worldwide, as only highly productive strains of a few major chicken breeds are used in industrial poultry farming. On the other hand, there is exhibition and ornamental poultry breeding, where productivity is not so important. Amateur poultry breeders help to maintain genetic diversity among domestic birds, especially the domestic chicken. There are 10 known chicken breeds in Bulgaria, two of which are recognized by the state institutions (Black Shumen and Stara Zagora Red Chicken) and the others are recognized or in the process of recognition by the Union of Fanciers and Small Domestic Animal Breeders in Bulgaria, which is a part of the European Association of Small Domestic Animal Breeders (EE). Depending on the presence or absence of dwarfism, the breeds can be divided into standard (Black Shumen Chicken, Stara Zagora Red Chicken, Katunitsa Chicken, Struma Chicken, Rhodope Painted Chicken, Southwest Bulgarian Chicken, and Bulgarian Longcrower) and miniature (Bregovska Dzhinka, Struma Bantam, and Southwest Bulgarian Dzhinka). The breeds with attractive appearances have higher populations compared to the productive ones, which are at risk of extinction.

Keywords: Genetic diversity, Bulgarian chicken breeds, Poultry genetic resources

Phylogenetic Research of the Hungarian Grey Cattle on a Full Representative Research Sample

MARÓTI-AGÓTS, Ákos[1*o] - KEMÉNY, Balázs[1] - WAGENHOFER, Zsombor[1] - JÓZSA, Csilla[2] - KALTENECKER, Endre[3] - GÁSPÁRDY, András[1]

[1] University of Veterinary Medicine Budapest, Institute for Animal Breeding, Nutrition and Laboratory Animal Science, 1078 Budapest, Hungary
[2] National Food Chain Safety Office, Animal Genetics Laboratory, 7400 Kaposvár, Hungary
[3] Hungarian Grey Cattle Breeders' Association, 1134 Budapest, Hungary

[*] Ákos MARÓTI-AGÓTS, corresponding author
[o] Ákos MARÓTI-AGÓTS, presenter

Abstract

This research aimed to characterise the mitochondrial diversity of the Hungarian Grey Cattle using a fully representative sample. Accordingly, the founder sampling method was used to investigate all possible different mitochondrial lineages. Based on pedigree data, 113 cow families were identified which represent the entire mitochondrial diversity of the breed. In this preliminary results publication, we describe identifying haplotypes of research sample mitochondrial hypervariable region (d-loop) sequences. The total number of haplotypes in the breed from 113 cow families was 43, most of which fell into haplogroup T3. The significant negative value of Fu's Fs statistic (-33.370, $p < 0.001$) based on haplotype frequencies demonstrated the asymmetric normal distribution curve which is typically indicative of a post-bottleneck effect. The haplogroups T1, T2, T3a, and T5 have been identified in the breed. The haplogroup T3-119, described only in Mongolia, was also found. The T3 haplogroup is the most abundant D-loop sequence in European cattle. The T1 and T5 haplogroups are typical of large-bodiedcattle, therefore these are the African and Near Eastern haplogroups, respectively.

Keywords: Hungarian Grey Cattle breed, Fully representative sample, Phylogeny, D-loop

Acknowledgments: This study was supported by the strategic research fund of the University of Veterinary Medicine Budapest (Grant No. SRF-001).

Genetic Structure of Pannon Rabbit Breeds

POSTA, János[1*o] - MATICS, Zsolt[2] - GERENCSÉR, Zsolt[3]

[1] University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Animal Science, Biotechnology and Nature Conservation, Department of Animal Husbandry, 4032 Debrecen, Hungary
[2] Széchenyi István University, Department of Animal Sciences, 9200 Mosonmagyaróvár, Hungary
[3] Hungarian University of Agriculture and Life Sciences (MATE), Institute of Animal Sciences, 7400 Kaposvár, Hungary

[*] János POSTA, corresponding author
[o] János POSTA, presenter

Abstract

The aim of the study was to evaluate the quality of the pedigree of Pannon White, Pannon Ka and Pannon Large rabbit breeds. The pedigree data was received from the breeding organization. The data of the registered animals up to 2022 were analysed, the active population in 2022 was chosen as the reference population. The complete generation equivalent was 13.69 for the Pannon White, 9.59 for the Pannon Ka and 21.79 for the Pannon Large reference populations. The average maximum generations were 43.54 for the Pannon White, 30.33 for the Pannon Ka and 44.32 for the Pannon Large breeds. The average relatedness varied between 5.00%-8.03%. The average Wright's inbreeding coefficient was the highest for the Pannon White breed (14.18%). Kalinowski's decomposition of inbreeding showed that inbreeding is originated mainly from the past; the current fixation of alleles was highest for the Pannon Ka breed. This research was supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences. Supported by the ÚNKP-23-5-DE-473 New National Excellence Program of The Ministry for Culture and Innovation from the source of the national research, development and innovation fund.

Keywords: Rabbit breeds, Pedigree data, Population structure

Researches of the Wild Boar Population (*Sus scrofa* L.) Timis county, Romania

ZOICANE, Eugen Catalin[*o] – MATIUTI, Marcel

Banat University of Agriculture and Veterinary Medicine of Timisoara, Faculty of Veterinary Science, 300645 Timisoara, Romania

[*] Eugen Catalin ZOICANE, corresponding author
[o] Eugen Catalin ZOICANE, presenter

Abstract

The wild boar represents one of the most required species by the hunters of Romania and abroad. Thus, in this paper, the evolution of wild boars population is presented, over a period of 10 years, from 2014 to 2023, in the Timis county, (the west of Romania). During the year 2019, the highest number of specimens had been registered, namely 3122, and in the following years the livestock decreased mainly because of the swine fever. To get a management of the best quality, concerning the hunting economics and hunting mainly, there is the Hunting Complex in Sarlota, possessing an enclosed terrain of 1204 ha, where the wild boar represents one of the main species. There is a hunting museum nearby, that is a good source of professional information. In the Barzava area, in the Arad county, hybridization is practised rarelt for commercial use, between the domestic swine and the wild boar.

Keywords: Wild boar, Game, Hunting park

Autochthonous and Local Horse Breeds in Bulgaria

LUKANOVA, Nadejda[*o]

Risk Assessment Center on Food Chain, 1000 Sofia, Bulgaria

[*] Nadejda LUKANOVA, corresponding author
[o] Nadejda LUKANOVA, presenter

Abstract

Livestock genetic diversity is a key resource that enables farmers to meet these challenges, but this diversity is in a state of decrease and that is another obstacle to sustainable animal husbandry. The preservation of local and autochthonous breeds of domestic animals is one of the important indicators for sustainable development of agriculture in individual countries. The population of autochthonous and local horse breeds is decreasing. Autochthonous breeds are those for which it has been proven, on the basis of historical sources, that they originated from the Republic of Bulgaria (Karakachan horse breed). Local breeds are those that, based on historical sources, have been proven to originate from the Republic of Bulgaria, or other ways, the Republic of Bulgaria was the original environment for breed development, and Bulgarian breeding documentation for them exists. Local national breeds have been bred in the Republic of Bulgaria more than 70 years (Danubian, Pleven and Eastbulgarian horse breeds). There is Bulgarian breeding documentation for the breeds, showing that the breeds have been kept for at least five generations, and breeding programs are performed for them.

Keywords: Horse, Breed, Autochthonous, Local breed

Key Points for a National Plan to Save the Indigenous Bulgarian East Balkan Pig Breed Threatened with Extinction

YARKOV, Dobry[1*]- KOSTOV, Ilyian[2] - GROZDANOVA, Dafinka[3]- MEYER-GERBAULET, Hinrich[1o]

[1] Trakia University, Faculty of Veterinary Medicine, Department of Animal Husbandry, 6015 Stara Zagora, Bulgaria
[2] Ministry of Agriculture and Food, 1606 Sofia, Bulgaria
[3] Agricultural University of Plovdiv, Faculty of Economics, Department of Economics, 4000 Plovdiv, Bulgaria

[*] Dobry YARKOV, corresponding author
[o] Hinrich MEYER-GERBAULET, presenter

Abstract

As a follow up to a previous conference in November 2023 on "East Balkan Swine (EBS) – A treasure of Bulgaria" at the Trakia University eight key points are presented for a national plan saving this breed from distinction. They would cover the topics of organisation of the management of the breed, measures to preserve the genetic pools and traditional keeping conditions, enforcement of animal health monitoring, conditions for the collection of pig products and corresponding quality control programmes as well as promotional measures. Based on a national breed saving programme an analogous Law and Ordinances should be adopted.

Keywords: Distinction of indigenous pig breed, Key aspects of saving the breed, National plan

Project "ROSS"

IVANOVA, Siliya* - TODOROVA, Ivana°

Trakia University, Faculty of Veterinary Medicine, Student campus, 6015 Stara Zagora, Bulgaria

* Siliya IVANOVA, corresponding author
° Ivana TODOROVA, presenter

Abstract

The aim of the project was to follow the results of feeding the broiler chickens with an antibiotic-free diet, adding whey and vitamins to the ration. Of interest are non-resistant alternatives for residue-free feeding that benefit productivity and health status by favourable modulation of the gut microbiota. We were provided with 40 chickens of the Ross breed, which we divided into 4 groups, as follows: first group - control, which are given food and water; second group - which added 50 ml/l of whey to the water; third group - which is added 100 ml/l of whey to the water; fourth group - to which are added 50 ml/l of whey to the water and 1g/l Biofungicide Enzyme Broth. Our study proves that the inclusion of 100 ml whey in 1l of water, improves the growth and body weight of broilers.

Keywords: Broiler chicken, Antibiotic-free diet, Whey

Plastination of Cross Sectioned Horse Penis for Anatomical Evaluation

DEMIRCI, Melis[1o]- BATUR, Barış[1,2*]- BAKICI, Caner[1]- YUNUS, Hasen Awel[1]

[1] Ankara University, Faculty of Veterinary Medicine, Department of Anatomy, 06110 Ankara, Türkiye
[2] Ankara University, Graduate School of Health Sciences, 06110 Ankara, Türkiye

[*] Barış BATUR, corresponding author
[o] Melis DEMIRCI, presenter

Abstract

Plastination is a preservation technique used for many purposes. Plastination entails substituting bodily fluids and fats with a polymerizable resin. The procedures for plastination are specimen preparation, fixation, freeze substitution for dehydration, strong impregnation, and curing. To visualize the anatomical structures, polyester plastination is successfully used for showing cross-sections of horse penis. It is primarily used in anatomical study, medical education, and research. The results of this study showed that the polyester plastination method can be used to evaluate the anatomical structures in the penis sections of equine. The use of specimens prepared through polyester plastination technique is believed to be beneficial in enhancing both theoretical and practical anatomy courses. These specimens, offering various sectional views, can be easily utilized in visual presentations such as museum displays. It is particularly considered that the final product does not entail any harmful effects on health.

Keywords: Polyester plastination, Musculocavernous type, Veterinary anatomy

Polyester Plastination: A Practical Tool for Investigating Sheep Stomach Anatomy

ORHAN, Doğa[1o]- BATUR, Barış[1,2*]- BAKICI, Caner[1]- YUNUS, Hasen Awel[1] – TSANDEV, Nikolay[3]

[1] Ankara University, Faculty of Veterinary Medicine, Department of Anatomy, 06110 Ankara, Türkiye
[2] Ankara University, Graduate School of Health Sciences, 06110 Ankara, Türkiye
[3] Trakia University, Faculty of Veterinary Medicine, Department of Anatomy, 6015 Stara Zagora, Bulgaria

[*]Caner BAKICI, corresponding author
[o] Doğa ORHAN, presenter

Abstract

Biological tissues can be preserved using a process called plastination that keeps the majority of their original appearance. The procedure of plastination involves replacing body fluids and fat with a polymerizable resin. The procedures for plastination are; specimen preparation, fixation, freeze substitution for dehydration, strong impregnation, and curing. To visualize the anatomical structures, polyester plastination was successfully used separately from each stomach compartment of the sheep. The cross-sections of rumen, reticulum, omasum and abomasum compartments of sheep stomach were successfully preserved via the polyester plastination technique. The use of samples made by using the polyester plastination technique is believed to improve both theoretical and practical anatomy courses. It is also believed to make it easier to use various cross-sectional samples in visual presentations, such as those held in museums. In addition, the finished product is safe for human health.

Keywords: Abomasum, Impregnation, Rumen, Sectional anatomy

Acute Kidney Injury (AKI) in Horses: Diagnosis and Therapeutic Approach

KARASTOEVA, Adelina*[o]- SABEV, Sasho

Trakia University, Faculty of Veterinary Medicine, Department of Internal Diseases, 6015 Stara Zagora, Bulgaria

[*]Adelina KARASTOEVA, corresponding author
[o] Adelina KARASTOEVA, presenter

Abstract

In horses, acute kidney injury is often secondary in etiology. Prompt diagnosis of this condition is of great importance for the positive outcome of treatment. Diagnosis is mainly relied on clinical and laboratory evaluation of patients. Diagnostic imaging is also of use in clinical practice. Treatment is aimed at correcting fluid deficits and electrolyte imbalance, as well as increasing renal perfusion and urine output. Diuretics, vasoactive substances, and antioxidants are useful in certain cases. Renal replacement therapy in horses is rarely used and impractical in most cases. Proper treatment relies on adequate diagnosis of the cause for renal function deterioration and frequent monitoring of the patient's status and adjustment of treatment. In this review we summarize the current treatment regimens for AKI in horses.

Keywords: Horses, AKI, SDMA, Diagnosis, Treatment

Comparative Visual Analysis Among Corrosion Casts and 3D Printed Models of the Vascular System of the Heads of Domestic Swine

TSANDEV, Nikolay[1*]- HRISTOVA, Hristiyana[1o] – BAKICI, Caner[2]

[1] Trakia University, Faculty of Veterinary Medicine, Department of Anatomy, 6015 Stara Zagora, Bulgaria
[2]Ankara University, Faculty of Veterinary Medicine, Department of Anatomy, 06110 Ankara, Türkiye

[*]Nikolay TSANDEV, corresponding author
[o] Hristiyana HRISTOVA, presenter

Abstract

The purpose of the present comparative analysis is to compare the results of corrosion preparations obtained after filling through the carotid arteries of a circulatory system of domestic pig heads with 3D models obtained after reconstruction, using a specialized computer program. The filling of the circulatory system was performed by simultaneous insertion of a plastic widely used in dentistry. After her polymerization, a chemical agent was used to corrode the soft tissues. The preparation of 3D was carried out by the computer tomography method. The obtained results give reason to conclude that 3D models have certain advantages over corrosion preparations in training, while the latter should be preferred in scientific research, especially for the identification of structures, with small dimensions. To them can be referred those located on the border between macro- and microscopic formations, recently designated as mesoscopic structures (about 100 μm).

Keywords: 3D reconstruction, Corrosion casts, Comparative analysis, Pig head arteries

Effect of Probiotics Administration on Health and Live Weight of Broiler Chickens

BOGDANOV, Ivan[o]- LAZARO, Lazarin[*]

Trakia University, Faculty of Veterinary Medicine, Department of Internal Diseases, 6015 Stara Zagora, Bulgaria

[*] Lazarin LAZAROV, corresponding author
[o] Ivan BOGDANOV, presenter

Abstract

Owing to the rise in consumer demand for livestock products from antibiotic-free production systems, there exists a great need for the development of antibiotic alternatives that can help improve performance and maintain optimal health of food animals. This study evaluated the possibilities of using of cow's milk whey as a growth promoter and non-specific immunostimulator in broiler production. Experimental treatments included one control (group A) and two experimental groups received respectively 5% (group B) and 10% (group C) fresh cow's milk whey added to the drinking water. For the experiment 150 one day mixed-sex Ross (308) broilers were used. Also, there were 5 replicate pens with 10 broilers and a stocking density 9.5 birds/m^2 for each pen at the beginning of the trial. Performance, carcass parameters, body and leg abnormalities, fear and stress responses, and some behavior expressions were investigated. The addition of whey influenced the final live body weight, hot carcass yield, heart, liver, spleen, abdominal fat, carcass and viscera ratio, the expression of dust bathing and foraging behaviors. At the end of the experiment, group C showed the best results in terms of the studied parameters, followed by group A and group B. Furthermore, there was an effect on feed conversion ratio, livability, back cleanliness, and expression of pecking behavior. In terms of live body weight, group C again had the best results ($P < 0.05$ vs. control group). It is suggested that milk whey added to drinking water alone or in a mixture with biologically active plant extracts and probiotic cultures could be used as a reliable growth promoter and non-specific immunostimulator in broiler chickens, alternative to antibiotics and coccidiostats.

Keywords: Chicken broiler, Cow's milk whey, Probitoic

The Importance of Nutrition and the Use of Anti-inflammatory Drugs in the Treatment of Dermatitis in Carnivores

DOBRE, Ionuț Răzvan[*o] - CIOCÂRLIE, Nicoleta

University of Agricultural Sciences and Veterinary Medicine Bucharest, Faculty of Veterinary Medicine, 050097 Bucharest, Romania

[*]Ionuț Răzvan DOBRE, corresponding author
[o] Ionuț Răzvan DOBRE, presenter

Abstract

Dermatitis of various causes is one of the most common pathologies encountered in carnivores, especially in the period from May to September. Our study focused on a number of 19 cases of carnivores (11 dogs and 8 cats) who presented to the veterinary clinic with dermatitis of different etiologies, with both auricular and skin localization. During the anamnesis, we noted the hyperproteic diet, as one of the most important factors favoring these conditions. The highest incidence was food allergic otitis in dogs (36.84%), followed by parasitic otitis in cats (31.57%), parasitic dermatitis in dogs (21.05%) and allergic dermatitis in cats (10.52%). Treatment included a hypoallergenic diet for a period of 8-12 weeks. Dexamethasone or Prednisolone was associated, in therapy, ensuring the success of the therapeutic approach. The success of the therapy was decisively favored by the hypoallergenic diet and the combination of anti-inflammatory drugs.

Keywords: Anti-inflammatory drugs, Dermatitis, Food, Therapy

Retroperitoneal Pendulans and Obturating Fibroma in a Dog (Golden Retriever) – A Clinical Case

KALKANOV, Ismet[*o] - GROZEVA, Ivelina

Trakia University, Faculty of Veterinary Medicine, Department of General and Clinical Pathology, 6015 Stara Zagora, Bulgaria

[*]Ismet KALKANOV, corresponding author
[o]Ismet KALKANOV, presenter

Abstract

Retroperitoneal tumors are rare tumors in animals as opposed to humans. Clinical signs usually develop later when the lesion is excessively enlarged. They are expressed by constipation, kyphosis of the back, tenesmus during defecation and urination, incontinence during urination. The rare clinical case we present describes the observed clinical, pathological, and histopathological findings in a dog with a retroperitoneal perirectal pendulous fibroma leading to pelvic canal obturation in a Golden Retriever. We support the opinion of authors that benign retroperitoneal tumors without metastases and invasive growth are largely operable and animals recover. But sometimes in a separate case, with affected tissues, organs and body cavities, as in our case, euthanasia is required for humane reasons, due to the inoperability of the tumor.

Keywords: Dog, Fibroma, Histopathology, Intra-pelvic, Pathology, Pathomorphology

Growth Performance of Common Carp (*Cyprinus carpio*) Co-cultivated with Lettuce (*Lactuca sativa*) in a Closed-loop Aquaponic System: Effects of Insect Meal, Insect Frass, and Hydroponic by Products

STAMELOS, Athanassios[1*]- LATOOS, Athanassios[1] - PAPAKYRIAKIDIS, Petros[1] - VLACHOS, Nikos[2] - KARAPANAGIOTIDIS, Ioannis[3]- BERILLIS, Panagiotis[3] - LEVIZOU, Efi[4] - ROUMBOS, Christos[4] - ATHANASSIOU, Christos [4] - KARAGIANNIS, Dimitrios[1] - KOKOKIRIS, Lambros[5o] - MENTE, Eleni[1]

[1]Aristotle University of Thessaloniki, School of Veterinary Medicine, Laboratory of Ichthyology Culture and Pathology of Aquatic Animals, 54124 Thessaloniki, Greece
[2]University of Patras, School of Agricultural Sciences, Department of Fisheries and Aquaculture, 30200 Mesolonghi, Greece
[3]University of Thessaly, School of Agricultural Sciences, Department of Ichthyology and Aquatic Environment, 38446 Volos, Greece
[4]University of Thessaly, School of Agricultural Sciences, Agriculture Crop Production and Rural Environment, 38446 Volos, Greece
[5]International Hellenic University, School of Health Sciences, Department of Nutritional Sciences and Dietetics, 57400 Thessaloniki, Greece

[*]Athanassios STAMELOS, corresponding author
[o] Lambros KOKOKIRIS, presenter

Abstract

The aim of this study was to test the effect of fish diets supplemented partially by insect meal or insect meal and hydroponic plant by-products on growth performance of common carp and lettuce in CLA system. A total of 297 carp individuals were distributed in nine autonomous CLA systems (144L each with a three part filtration unit). Fish were fed ad libitum three times daily a diet contained fish meal (control), a diet in which 50% of the fishmeal of C diet was replaced by insect meal (*Hermetia illucens*, B/A diet) and a diet, in which 50% of C diet was replaced by a 2:1:1 mixture of insect meal, insect frass and hydroponic by-products (lettuce plant residues, F/B diet). Water quality was recorded daily. Fish length and weight, were measured three times post initiation for each treatment (day 0, 23rd and 45th post initiation) and weight gain and specific growth rate were calculated. The final key metrics of lettuce were calculated 45 dpi for each treatment. Water quality showed similar variations between treatments ($P>0.05$). Similarly, mean carp weight gain and mean SGR values were similar between treatments ($P>0.05$). Similarly to carp, all the key parameters used to describe the lettuce performance showed similar values between treatments ($P>0.05$). The roots to shoot ratio values and also the SGR values of lettuce were optimal indicating that fish diets based on insects meals or and by products of lettuce (50% of the fish protein content of control diet) provide enough resources for the successful growth performance of lettuce in CLA systems

Keywords: Aquaponics, Black soldier fly, Carp, Circular economy, Lettuce

Acknowledgments: This study was supported by the strategic research fund of the University of Veterinary Medicine Budapest (Grant No. SRF-001).

A Tri-trophic Production System of Red Tilapia Fed on Insect Meal Co-cultivated with Cucumber: The Effect of Production System on Water Quality and Biomass Production

MOURANTIAN, Anastasia[1]*- CHATZINIKOLAOU, Maria[1]- FALIAGKA, Sofia[1]- ATHANASIOU, Christos[1], KARAPANAGIOTIDIS, Ioannis[2] - KOKOKIRIS, Lambros[3o] - MENTE, Eleni[4] - KATSOULAS, Nikos[1]- LEVIZOU, Efi[1]

[1]University of Thessaly, School of Agricultural Sciences, Agriculture Crop Production and Rural Environment, 38446 Volos, Greece
[2]University of Thessaly, School of Agricultural Sciences, Department of Ichthyology and Aquatic Environment, 38446 Volos, Greece
[3]International Hellenic University, School of Health Sciences, Department of Nutritional Sciences and Dietetics, 57400 Thessaloniki, Greece
[4]Aristotle University of Thessaloniki, School of Veterinary Medicine, Laboratory of Ichthyology Culture and Pathology of Aquatic Animals, 54124 Thessaloniki, Greece

*Anastasia MOURANTIAN, corresponding author
°Lambros KOKOKIRIS, presenter

Abstract

The aim of this study was to assess the effects of a circular tri-trophic co-cultivation model (i.e., red tilapia, cucumber, and black soldier fly) arranged as a fish-centric coupled aquaponics (CAP, aquaculture, and hydroponic units are arranged in a single loop) or a plant-centric decoupled aquaponics (DECAP, aquaculture, and hydroponics units are arranged in a multi-loop setup as separate units) on water quality as well as fish and crop biomass yields. The 90-day experiment undertaken in a greenhouse at the University of Thessaly. A total of 329 red tilapias (*Oreochromis* spp., 141.1 kg) were allocated randomly to three systems: the hydroponic production system (HP), which served as the control; the CAP, which directly transferred the RAS solution to the crops; and the DCAP, which enriched the RAS solution with nutrients to meet the HP concentration targets. Aquafeed pellets containing black soldier fly (*Hermetia illucens*) larvae were fed to the fish twice a day at 0.8% of their body weight. Cucumber plants (*Cucumis sativa*) were gwown on perlite substrates. pH, electic conductivity (EC), and the main nutrients (NO_3^-, NH_4^+, PO_4^{-2}, K^+) were determined in the irrigation solution at 10-day intervals. At the end, the fish gained 18.8 kg. The pH and EC fluctuated similarly in HP and DCAP, and, like all main nutrients, they had their lowest values in the CAP system (without any external fertilizer input). The aerial biomass of cucumbers was significantly higher in the DCAP (1686 g), followed by the HP (1495 g) and CAP (633 g) treatments. However, PO_4^{-2} was slightly higher, but NH_4^+ levels were significantly higher in DCAP compared to HP treatment. These findings support the nutrient deficiencies and imbalances typically reported in the CAP solution and the similar water quality parameters and effects on nutrient assimilation between DCAP and HP aquaponic systems.

Keywords: Aquaponics, Circular economy, Hydroponics

Acknowledgments: The project is funded by the Green Fund, under the Programme "Natural Environment&Innovative Actions 2022", "Research&Application" (www.prasinotameio.gr)

Closing the Loop: Inclusion of Hydroponic by Products into the Diet of Hermetia illucens Larvae Produced as Aquafeed Ingredient for Aquaponics

KOLORIZOS, Andreas[1]- RUMBOS, Christos[1]- ATHANASIOU, Christos[1], KARAPANAGIOTIDIS, Ioannis[2] - KOKOKIRIS, Lambros[3o] - MENTE, Eleni[4*]

[1]University of Thessaly, School of Agricultural Sciences, Agriculture Crop Production and Rural Environment, 38446 Volos, Greece
[2]University of Thessaly, School of Agricultural Sciences, Department of Ichthyology and Aquatic Environment, 38446 Volos, Greece
[3]International Hellenic University, School of Health Sciences, Department of Nutritional Sciences and Dietetics, 57400 Thessaloniki, Greece
[4]Aristotle University of Thessaloniki, School of Veterinary Medicine, Laboratory of Ichthyology Culture and Pathology of Aquatic Animals, 54124 Thessaloniki, Greece

[*]Eleni MENTE, corresponding author
[o] Lambros KOKOKIRIS, presenter

Abstract

The aim of this study was to assess the performance of black soldier fly (BSF, Hermatia illucens) larvae fed wheat bran-based substrates containing varying percentages of hydroponic by-products. The trial was performed under constant laboratory conditions using six-day-old BSF larvae (n=50). The hydroponic by-products (used residues) were the side-streams of tomato and cucumber production, i.e., the vegetative parts of tomato and cucumber plants (i.e., leaves and stems), as well as low-quality, non-marketable cucumbers and tomato fruits grounded into paste. Plastic cylindrical vials were used as experimental units. BSF larvae, previously weighed and measured as a group, were introduced in vials together with 15 g of each wheat bran-based feeding substrate containing five percentages of hydroponic by-products (i.e., at 0%, 25%, 50%, 75%, and 100%). High survival rates were recorded (>80%), and survival was not affected by treatment. Larval growth was significantly affected by treatment for most of the evaluation points. The inclusion of hydroponic by-products at high rates (50 and 75%) significantly hindered BSF larval growth for most of the evaluation points. The dietary treatments with the wheat bran substrates containing hydroponic by products at rates up to 50% had a similar effect on BSF larvae growth compared to the control. The findings of this study clearly indicate that the use of hydroponic by products to feed BSF larvae offers an efficient waste management solution for hydroponic cultivation

Keywords: Black soldier fly, Circular economy, Insect-based aquafeeds, Insect protein

Acknowledgments: Aquaponics from Wastewater Reclamation project has received funding from the European Union's Horizon Europe Research and Innovation Actions, under grant agreement N° 101084245. This output reflects the views only of the author(s), and the European Union cannot be held responsible for any use which may be made of the information contained therein.

Comparative Measurements of Surface Body Temperature of Balkan Donkeys Using Infrared Thermography

STAMBEROV, Petar* - HRISTOV, Kalin - STOIMENOV, Aleksandar - MARINCHEVA, Victoria - MARINOVA, Mina-Maria[o]

University of Forestry, Faculty of Veterinary Medicine, 1000 Sofia, Bulgaria

[*]Petar STAMBEROV, corresponding author
[o]Mina-Maria MARINOVA, presenter

Abstract

Infrared thermography is an increasingly popular diagnostic method in equine veterinary medicine, while its application in donkeys remains relatively limited. The aim of this study was to determine the surface body temperature of six clinically healthy dairy donkeys. The donkeys` bodies were divided into the following regions: neck, shoulder, thoracic limb, back, thigh and pelvic limb and were laterally scanned on both the left and right sides. Only the abdominal region of the donkeys was scanned individually. The mean surface temperature of each region was calculated revealing approximately bilateral thermal symmetry in the donkeys' bodies. Similar studies may be useful for donkey welfare given the renewed interest in donkeys as milking producers.

Keywords: Balkan donkey, Body surface temperature, Infrared thermography, Welfare

Genetic Characterization of Lipizzan Breed Using Pedigree Information

KOVÁCS, Máté[1*]- MIHÓK, Sándor [2] - POSTA, János[2o]

[1] University of Debrecen, Doctoral School of Animal Science, 4032 Debrecen, Hungary
[2] University of Debrecen, Faculty of Agricultural and Food Sciences and Environmental Management, Institute of Animal Science, Biotechnology and Nature Conservation, Department of Animal Husbandry, 4032 Debrecen, Hungary

[*]Máté KOVÁCS, corresponding author
[o] János POSTA, presenter

Abstract

Modern animal husbandry has drastically changed the genetic structure of livestock species. The varieties, genotypes supposed to be not necessary at the moment, can only be saved from extinction by gene conservation. Traditional Hungarian horse breeds have a long history and a demonstrably different genetic structure from other horse breeds in Europe and the world. As a result, their enormous genetic value is undoubted. The aim of the study was the evaluation of the genetic structure of the mare families appearing in the Hungarian Lipizzan horse breed population. There are 35 mare families among the total 61 present in the Hungarian population, which could be categorized into 11 Hungarian, 15 original, 5 Croatian and 1 Slovenian mare families. The distribution of these mare families is unbalanced. Seven mare families accounting for 56.36% of the total population. Given the basic requirements of gene conservation work, this condition is far from optimal.

Keywords: Lipizzan, Genetic structure, Gene conservation, Mare families

Unlocking the Potential of Immunobeta®: A Promising Immunomodulator for Enhancing Humoral Immune Factors in Rainbow Trout

TERZIEV, Neven[1o] - KOYNARSKI, Tsvetoslav[2*] - SECER, Faik Sertel[3]

[1] Trakia University, Faculty of Agriculture, Department of Animal Husbandry - Non-ruminants and Special Industries, 6015 Stara Zagora, Bulgaria
[2] Trakia University, Faculty of Veterinary Medicine, Department of Animal Husbandry, 6014 Stara Zagora, Bulgaria
[3] Ankara University, Faculty of Agriculture, Department of Fisheries and Aquaculture, 06110 Ankara, Türkiye

[*]Tsvetoslav KOYNARSKI, corresponding author
[o] Neven TERZIEV, presenter

Abstract

The integration of immunomodulators as a compelling alternative to conventional pharmaceuticals, chemicals, and antibiotics for augmenting growth performance and fortifying immunity in aquaculture represents a judicious paradigm shift. Amidst this context, the present study endeavors to scrutinize the efficacy of the immunomodulator Immunobeta® on specific humoral immune factors in rainbow trout (*Oncorhynchus mykiss*). A cohort of 3000 fish was segregated into three equivalent groups. The control group (CG) received a standard diet bereft of supplementation, while the experimental groups were administered the same diet enriched with Immunobeta® at dosages of 2.5 kg/ton for Group EG25 and 5 kg/ton for Group EG50, respectively, over a 10-day period. Post-treatment cessation, the residual effects of the immunomodulatory agent was assessed one month later. Results evince that Immunobeta® conferred a salutary impact on blood serum lysozyme concentration, alongside augmenting both the alternative and classical pathways of complement activation in experimental fish. These findings underscore the potential of Immunobeta® as a promising alternative to conventional drugs, offering a holistic approach to enhancing growth performance and bolstering immune resilience in aquaculture practices. Supplementation with Immunobeta® at a dosage of 5 kg/ton of feed elicited significant enhancements in natural humoral immune factors in rainbow trout, advocating for its prudent incorporation into aquafeed formulations to optimize production outcomes and ensure sustainable aquaculture practices.

Keywords: Aquaculture, Humoral immune factors, Immunomodulator, Rainbow trout

The Effects of Stocking Density on Certain Acute Phase Proteins and Corticosteroid Stress Hormone in African catfish (*Clarias gariepinus*) Reared in RAS with Low-water Exchange

PENEV, Veselin[1o] - BOZHKOV, Atanas[1] - ZAPRYANOVA, Dimitrinka[2*] - ÜRKU, Cigdem[3] - NIKOLOV, Galin[1]

[1] Trakia University, Faculty of Agriculture, Department of Animal Husbandry - Non-ruminants and Special Industries, 6015 Stara Zagora, Bulgaria
[2] Trakia University, Faculty of Veterinary Medicine, Department of Biochemistry, 6014 Stara Zagora, Bulgaria
[3] Istanbul University, Faculty of Aquatic Sciences, Department of Fish Diseases, 34134 Istanbul, Türkiye

[*]Dimitrinka ZAPRYANOVA, corresponding author
[o]Veselin PENEV, presenter

Abstract

Stocking density is an important factor that can affect the degree of physiological stress on fish, as the change usually results in a stress effect, affecting the animals' welfare and health status. During the production process in aquaculture, alteration in this most important stress factor usually leads to changes in growth performance, development and blood parameters of reared animals. This study's objective was to assess C-reactive protein, ceruloplasmin, fibrinogen and cortisol values as stress and well-being markers in African catfish housed at different stocking densities. The fish were reared for 60 days in RAS with a low-water exchange, divided into two stocking densities as follows: 4.55 kg/m^3 (60 fish/m^3) for group SD60; 6.45 kg/m^3 (100 fish/m^3) for group SD100, respectively. The blood variables in selected parameters were assessed at the start and end of the experiment. The results of the present study revealed that the concentrations of the investigated acute phase proteins (APPs), and the stress hormone responded with an increase with increasing stocking density. Measurements of these parameters can be used as screening tests for systemic responses to variations in stocking density in catfish RAS farming.

Keywords: Acute Phase Proteins (APPs), African catfish, Cortisol, Stocking density

First Study on the Sperm Production of Boars from the East Balkan Pig

MAVROVSKI, Angel[1*o] - PETROV, Rusko[1, 2] - KARASTOYANOVA, Nadezhda[3] - MALINOVA, Radka[4] - IVANOV, Martin[1] - YARKOV, Dobry[1]

[1] Trakia University, Faculty of Veterinary Medicine, Department of Animal Husbandry, 6014 Stara Zagora, Bulgaria
[2] Green Balkans NGO, 6000 Stara Zagora, Bulgaria
[3] National Museum of Natural History, 1000 Sofia, Bulgaria
[4] Agricultural University of Plovdiv, Faculty of Agronomy, Department of Animal Sciences, 4000 Plovdiv, Bulgaria

[*] Angel MAVROVSKI, corresponding author
[o] Angel MAVROVSKI, presenter

Abstract

For the first time in our country, on a dummy for the purposes of artificial insemination from October 2023. The semen was regularly obtained from boars of the Eastern Balkan Pig breed from trained boars. The aim of the study is to determine ejaculate volume, concentration, number of doses for insemination. The study covered the period from October 2023 to May 2024, and 77 ejaculates from 10 boars were examined. In the analysis of seminal fluid, we found an average volume of the ejaculate of 161.4 ± 5.281 ml, with the minimum and maximum values being within very wide limits – 40 ÷ 300 ml. Sperm concentration and total concentration were, respectively, 0.575±0.012 1x10⁹/ml and 90.89±2.675 1x10⁹. The reported mean number of doses received from one ejaculate was 10,618±0,43. The individual as a fixed factor has a reliable variation on the studied parameters of the sperm at ***P<0.001. A reliable source of variation in total concentration and number of insemination doses appears to be the month of semen collection. Individual within year significantly affected mainly ejaculate volume, concentration (***P<0.001) and total concentration (*P<0.05). When analyzing the monthly dynamics of the main indicators, lower values were observed for most of them during the first two months of the experiment. The obtained results are logical, since this period coincides with the period of accustoming the breeders to receiving seminal fluid.

Keywords: Breed, Doses, East Balkan pig, Ejaculate

Lipid and Mineral Profile Studies in Ewes with Ketosis

MARUTSOVA, Vania* - KAVARDZHIEV, Petar[o]

Trakia University, Faculty of Veterinary Medicine, Department of Internal Diseases, 6014 Stara Zagora, Bulgaria

[*]Vania MARUTSOVA, corresponding author
[o] Petar KAVARDZHIEV, presenter

Abstract

The purpose of the present study was to determine the changes in lipid and mineral metabolism in Lacon and Mouton Charollais ewes with ketosis. Blood samples were obtained for determination of β-hydroxybutyrate (BHBA), non-esterified fatty acids (NEFA), total cholesterol (TC), low-density (LDL-C) and high-density lipoproteins (HDL-C), triglycerides (TG), Ca, P and Mg. The ewes were divided in 3 groups: pregnant, recently lambed and lactating. They were classified as healthy (C), with subclinical (SCK) and clinical ketosis (CK) depending on their blood BHBA levels. The quantities of NEFA in Lacon ewes with SCK were elevated, while in ewes with CK – decreased. None of Mouton Charollais ewes had blood BHBA >0.8 mmol/l. The concentrations of TC and HDL-C decreased, while LDL-C and TG - increased in Lacon ewes with SCK and CK. The levels of Ca and P - decreased in Lacon ewes with SCK, while the levels of Mg doesn't change in group I and decreased in group II and III. The quantities of minerals in ewes with CK decreased. In Mouton Charollais ewes there were no changes in two profiles.

Keywords: Ewes, Ketosis, Lipids, Minerals

Editor: Associate Prof. Dr Lazarin LAZAROV, PhD
Trakia University, Faculty of Veterinary Medicine
6015 Stara Zagora, Student campus, Bulgaria
(+359 42) 699 505
https://trakia-uni.bg/en/about-us/faculties/veterinary-medicine-faculty

DAGENE
International Association for the Conservation
of Animal Breeds in the Danube Region
1078 Budapest, István Street 2, Hungary
www.dagene.eu