Program and Abstract Book of the

30th Annual Meeting of

DAGENE

May 29th 2019 – June 1st 2019

Castle in Topolčianky

(Parková 1, 951 93 Topoľčianky)

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

Program of the 30th Annual Meeting of DAGENE 2019

29.5.-1.6.2019, Topol'čianky

29.5.2019

15:00 – 18:00	Arrival at Chateau Topol'čianky, registration, occupation of accommodation
18:30 – 20:00	Dinner
20:00 – 21:00	DAGENE Board of Directors meeting

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30.05.2019

07:30 – 09:00	Breakfast and registration
09:00 – 09:10	Opening of Conference
09:10 – 10:45	Presentation of scientific papers
10:45 – 11:30	Coffee break
11:30 – 12:30	Presentation of scientific papers
12:30 – 13:30	Lunch
13:30 – 15:00	Presentation of scientific papers and posters
15:00 – 16:00	Coffee break and Poster session
16:00 – 18:00	The National Stud Farm visiting (https://www.topolcianky.sk/kultura-a-sport/volny-cas/zaujimavosti-obce/narodny-zrebcin-topolcianky/)
18:30 – 21:00	Gala Dinner

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31.05.2019

07:30 – 08:30	Breakfast
08:30 – 09:30	General Assembly
09:30 – 18:30	Bison game preserve Topoľčianky (https://zubor.fotop.sk/en/o-nas) Lunch „Zbojská" (http://www.zbojska.sk/ Horses (National Park of Muránska planina) http://www.muranskaplanina.com/zaujimavosti-uzemia/priroda/kone-na-planine/ Walachian Sheep farm („Zbojská")
20:00 – 21:00	Dinner

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01.06.2019

07:30 – 08:30	Breakfast
09:00 – 10:00	Farewell and Departure

PROGRAM OF THE SCIENTIFIC PRESENTATIONS DAGENE 2019

30.5.2019 Thursday

07:30 – 09:00	**Breakfast and registration**
09:00 – 09:10	**Opening: Gáspárdy A. and Chrenek P.**
Session 1	**Chair: Chrenek P. and Ivankovic A.**
09:10 – 09:30	**Tomka J.**: Animal Genetic resources in Slovak Republic, *NPPC – Research Institute for Animal Production Nitra, Slovakia*
09:30 – 09:45	**Posta J.**: Genetic connectedness of breeding populations of Hucul breeder countries, *University of Debrecen, Hungary*
09.45 – 10:00	**Ramljak J.**: Exterior features and trends in stallion's lines of the Croatian Posavina horse, *University of Zagreb, Croatia*
10:00 – 10:15	**Posta J.**: Pedigree analysis of the Hungarian Coldblood Horse breeding population, *University of Debrecen, Hungary*
10:15 – 10:30	**Klein R.**: Genetic diversity of the Hungarian Furioso-North Star Horse population, *University of Debrecen, Hungary*
10:30 – 10:45	**Kasarda R.**: Common origin of local cattle breeds in western region of Carpathians, *Slovak University of Agriculture in Nitra, Slovakia*
10:45 – 11:30	**Coffee break**
11:30 – 11:45	**Török E.**: Analyses of factors affecting the longevity of Hungarian Simmental beef cows, *University of Debrecen, Hungary*
11:45 – 12:00	**Makarevich A**.: Cryopreservation of in vitro matured bovine oocytes *NPPC – Research Institute for Animal Production Nitra, Slovakia*
12:00 – 12:15	**Tóth M.**.: Analyses of meat producing performance in Tsigai rams by real-time ultrasound, *University of Debrecen, Hungary*
12:15 – 12:30	**Becskei Zs.**: Sensory characteristics of lamb meat of three Zackel sheep type in Serbia, *University of Belgrade, Serbia*
12:30 – 13:30	**Lunch**

PROGRAM OF THE SCIENTIFIC PRESENTATIONS DAGENE 2019

30.5.2019 Thursday

Session 2	**Chair: Kasarda R. and Tomka J.**
13:30 – 13:45	**Kovács E.**: STR polymorphisms of a historical sheep breed, the Cikta, *Széchenyi István University, Hungary*
13:45 – 14:00	**Žan Lotrič M.**: The Role of the Slovenian Autochthonous Drežnica Goat Breed in the Area of Sustainability of the Alpine Pasture and Alpine Dairy Farming, *University of Ljubljana, Slovenia*
14:00 – 14:15	**Tempfli K.**: Prolactin genotype is associated with egg production in Hungarian Yellow hens, *Széchenyi István University, Hungary*
14:15 – 14:30	**Svoradová A.**: Comparison of two staining techniques of Oravka cock semen using specific markers by flow cytometry, *Constantine the Philosopher University in Nitra, Slovakia*
14:30 – 14:45	**Sandeva G.**: Determination of mineral composition and nutritional value of snail meat for human consumption cultivated in mini-paddock pen system, *Trakia University, Bulgaria*
14:45 – 15:00	**Atanasoff A.**: Proximate and nutritional profile of raw and cooked of snail meat (Helix lucorum), *Trakia University, Bulgaria*
15:00 – 16:00	**Coffee break and Poster session**
	Dragin S.: Phenotypic characteristics of the Tsigai sheep breed in Vojvodina - North Serbia, *University of Novi Sad, Serbia*
	Urku C.: Early determination of gender in Siberian sturgeon (Acipenser baerii) using ultrasound and biopsy techniques, *Trakia University, Bulgaria*
16:00 – 18:00	The National Stud Farm visiting
18:30 - 21:00	**Gala Dinner**

Animal Genetic resources in Slovak Republic

TOMKA, Ján – HUBA, Ján

NPPC – Research Institute for Animal Production Nitra, Hlohovecká 2, 95141 Lužianky, Slovak Republic

The animal genetic resources represent very important part of agriculture. In order to be able to undertake actions for conservation of endangered breeds, monitoring of the actual state of populations has to be in place. This paper provides a short look on the actual state of animal genetic resources in Slovak Republic and its change over the time. The data for regular updating of EFABIS information system were used in the study. Results showed different trends in different species. In cattle there was decrease in dairy breeds, while increasing trend was observed in Slovak Spotted cattle and beef breeds. In the sheep rapid decrease in population size of traditional breeds was observed. In goat population sizes of traditional breeds increased. The numbers of animals of pig, horse, poultry and rabbit breeds were more-less stabilized. In many cases the preference of farmer for the single breed and his passion is the only reason for keeping the animals. In this regard the raising awareness is a very important part of animal genetic resources conservation.

Genetic connectedness of breeding populations of Hucul breeder countries

SOMOGYVÁRI, Enikő – POSTA, János – MIHÓK, Sándor

Department of Animal Husbandry, University of Debrecen, H-4032 Debrecen, Böszörményi str.138, Hungary

The Hucul horse is originated from the former Austrian-Hungarian Monarchy, from the wooden Carpathian region. The structure of the total population was described from available pedigree information of the breeder countries using Nei's minimum distance and F statistics. Appearance of stallion lines and mare families were also evaluated. Only three stallion lines have appeared in all examined countries. Among the 42 mare families only one, 4 Kitca, was found in each breeder countries. Genetic diversity might be decreased due to 11 mare families were appeared only in one country. Smallest pairwise genetic distance was found between sub-populations of the Czech Republic and Slovakia, whereas longest was found between those of Romania and Poland based on both measurement variables. Lowest within population differences were found for the small German population.

Exterior features and trends in stallion's lines of the Croatian Posavina horse

IVANKOVIĆ, Ante[1] – RAMLJAK, Jelena[1] – GRABIĆ, Hrvoje[2] – ŠUBEK, Ivan[2]

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Croatian Posavina horse is one of the three autochthonous horse breeds in Croatia. During the past twenty-five years, his program of protection has been implemented. After inventarisation and stopping the decline of the population, the breeding organisation formed sire lines to efficiently improve the breeding program. The Croatian Posavina horse has defined 30 sire lines. It was necessary to determine the conformation of the sire lines, therefore 92 active studs were included in research and through it collaboration with the breeding association was achieved. The determined values of the withers height, chest circumference and the cannon bone circumference were 141.98 ± 4.34 cm, 194.17 ± 8.47 cm, and 22.18 ± 0.95 cm, respectively. According to the previous study, stallions in this research have smaller values for withers height (-1.55 cm; $p < 0.05$) and chest circumference (-5.82 cm) while the cannon bone circumference was wider (+0.28 cm). Comparing the dispersion parameters revealed that the phenotypic variation of the examined traits has decreased, which can serve as a good indicator of the consolidation of exterior traits. Monitoring of the breed through phenotypic level and planned mating, should be continued in order to provide its viability. In addition, stronger efforts should be made in promotion and economic affirmation of the breed, especially if long-term sustainability is expected. Good breeding practice encompass regular monitoring of the population trends by analysing phenotype variability within Croatian Posavina Horse populations. Furthermore, balance between sire and dam lines will help in preserving genetic diversity as one of the important component of conservation program.

Pedigree analysis of the Hungarian Coldblood Horse breeding population

POSTA, János[1] – OLÁH, János[2] – MIHÓK, Sándor[1]

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[2]Farm and Regional Research Institute of Debrecen, University of Debrecen, H-4032 Debrecen, Böszörményi str.138, Hungary

An effective gene conservation programme requires the knowledge of genetic diversity of the population. The genetic structure of Hungarian Coldblood Horse breed was studied from pedigree records. Herdbook data of the active breeding population in 2016 of registered Hungarian Coldblood horses were analysed. The generation interval varied between 8.71 and 10.22 for the analysed population. The proportion of known parents for the reference population was above 50% in the 6th generation. There were 3,434 and 427 horses covering the total genetic variability of the whole and reference populations. Most important ancestors were Belgian import stallions for the whole population, whereas it was a French import stallion for the reference stock. Average inbreeding coefficient of the reference stock is 1.8%. There are 27 horses having higher than 10% inbreeding coefficient in the reference population.

Genetic diversity of the Hungarian Furioso-North Star Horse population

KLEIN, Renáta[1]– OLÁH, János[2] – MIHÓK, Sándor[1] – POSTA, János[1]

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The most common goal of animal conservation programmes is to maintain genetic diversity. The genetic structure of Furioso-North Star horse breed was studied from pedigree records. Herdbook data of the active breeding population in 2016 of registered Furioso-North Star horses were analysed. The generation interval varied between 10.05 and 12.40 for the analysed population. There were 3,328 and 534 horses covering the total genetic variability of the whole and reference populations, respectively. Most important ancestor was the English Thoroughbred North Star III (2.67%) for the whole population, whereas it was Furioso III-4 (VI.tm) (6.65%) for the reference population, respectively. There were 23 horses having higher than 25% inbreeding coefficient in the reference population.

Common origin of local cattle breeds in western region of Carpathians

KASARDA, Radovan[1] – MORAVČÍKOVÁ, Nina[1] – KADLEČÍK, Ondrej[1] – TRAKOVICKÁ, Anna[1] – ŽITNÝ, Július[1] – TERPAJ, Vasil Petrovič[2] – MINDEKOVÁ, Silvia[3] – NEUPANE MLYNEKOVÁ, Lenka[3]

[1]Slovak University of Agriculture in Nitra, Department of Animal Genetics and Breeding Biology, Tr. A. Hlinku 2, 94976 Nitra, Slovakia
[2]Association of Carpathian Brown Cattle, Mukatchevska 2, Šenborn, Ukraine
[3]The Breeding Services of the Slovak Republic, s. e., Hlohovecká 5, 95141 Lužianky, Slovakia

The aim of this study was to analyse the genetic relationships and the state of diversity within and across three local breeds originating from western Carpathians by using microsatellite markers. In total of 214 biological samples representing the gene pool of Slovak Pinzgau, Slovak Spotted and Brown Carpathian cattle (UA) were genotyped using a set of 11 microsatellites that are primarily recommended by the ISAG for paternity testing. All of applied biostatistics approaches indicated that most of the genetic variation was conserved within individuals on the metapopulation level (92%), while the subdivision of cattle populations explained only 6% of variation. Similarly, the Wright F_{ST} index (F_{ST}=0.036±0.004) and Nei's genetic distances (D_A=0.211±0.031) pointed out to relatively high level of genetic similarity among breeds under consideration. The highest genetic identity revealed Slovak Spotted and Brown Carpathian cattle. On the other hand, the analysis of genetic variability conserved within each breed showed only negligible loss of genetic diversity.

Analyses of factors affecting the longevity of Hungarian Simmental beef cows

TÖRÖK, Evelin – SZABÓ, Krisztina – POSTA, János

Department of Animal Husbandry, University of Debrecen, H-4032 Debrecen, Böszörményi str.138, Hungary

The Hungarian Simmental cow is the dual purposed breed, because it is good at milk and meat production. Beside the good milk and meat production and quality, the Simmental cow has some important traits, for example longer productive life. The longevity is the time period between first calving and culling. It was only 2.7 for Hungarian Simmental Cattle in 2012 (BEDŐ, 2014). The aim of this study was to analyse the longevity of Hungarian Simmental breed, to evaluate the effects of sex of first calf, size of herd, age at first calving, year, month and season of first calving. Based on Cox-regression, the season of the first calving and the size of herd had significant effects on longevity. The sex of the first calf was not significant for the analysed animals. For cows, having first calving in winter, were estimated lower risk ratio. The biggest risk ratio was estimated for cows calving in summer. The highest risk ratio was estimated for the medium size herd (20-50) and the lower risk ratio was for the small size of herd (<20).

Cryopreservation of in vitro matured bovine oocytes

MAKAREVICH, Alexander V. – OLEXIKOVÁ, Lucia – BEDEOVÁ, Linda – KUBOVIČOVÁ, Elena

National Agricultural and Food Centre, Research Institute of Animal Production Nitra, Hlohovecka 2, 95141 Lužianky-near-Nitra, Slovak Republic

Cryopreservation of matured oocytes generally shows variable results worldwide because of problems encountered during fertilization and embryo development. The aim of present study was to examine the approach of freezing of the bovine cumulus-oocyte complexes (COC) without surrounding ovarian tissue. Prior to freezing the oocytes were matured *in vitro* and afterwards frozen by an ultra-rapid cooling technique in minimum volume using 300 mesh electron microscopy nickel grids as a carrier. After vitrification/warming of the oocytes their developmental competence was verified by in vitro fertilization (IVF) procedure and subsequent embryo culture until blastocyst stage. Using this design we obtained more than 56% cleavage rate and about 9.4% reached the blastocyst stage, which proves that the cumulus-oocyte complexes after vitrification/warming can retain their developmental ability. In conclusion, our preliminary experiments show that cryopreservation of matured cumulus-oocyte complexes is, in our conditions, more promising than the vitrification of ovarian tissue fragments. However it requires further optimization of an oocyte cryopreservation regimen.

Analyses of meat producing performance in Tsigai rams by real-time ultrasound

OLÁH, János – TÓTH, Mariann – MOLNÁR, Andrea – JÁVOR, András – KHANGEMBAM, Rojesh – EGERSZEGI, István

Department of Animal Husbandry, University of Debrecen, H-4032 Debrecen, Böszörményi str.138, Hungary

Sheep (Ovis aries) is one of the first domesticated animals and sheep husbandry is a valuable trade for its meat, wool, milk and hide. Out of these product, the sheep meat, or mutton, is the most requested and it accounts for 2.82% of the world's meat production. For export as well as sale in the domestic markets of lamb, the appropriate meat conformation with the best grade is a desirable breeding characteristic. Since the breeding stock cannot be slaughtered, we have to estimate the traits of sheep meat indirectly by observing the animals using ultrasonography to obtain objective measurements. Ultrasonic devices are efficiently used to assess meat grades in the swine sector, to a lesser extent in cattle, but relatively few uses in the domestic sheep sector. Our study adopted this ultrasonography examination using the registered Tsigai rams to assess the meat/body grades. This is done by measuring the eye muscle depth (EMD) and the back fat thickness (BFT) of the sheep. It is known that rib eye has high heritability and those animals having good and desirable meat traits are well inherited. In Hungary, the annual meat consumption is 2 kg/person/year out of which only 0.3kg/person/year come from mutton, which is very low. From the point of view of Hungary's sheep breeding, the real-time ultrasound technology offers the possibility of a potential method for selection of breeding stocks for sheep meat.

Sensory characteristics of lamb meat of three Zackel sheep type in Serbia

SAVIĆ, Mila[1] – GÁSPÁRDY, András[2] – BECSKEI, Zsolt[1]

[1]Faculty of Veterinary Medicine University of Belgrade, Bulevar Oslobođenja 18, Serbia
[2]University of Veterinary Medicine Budapest, István utca 2, Budapest, Hungary

Meat quality characteristics (*m. longissimus dorsi*) were evaluated in lambs of three types of autochthonous Zackel sheep: Sjenica sheep, Lipe sheep and Vlashko Vitoroga sheep, reared in traditional habitats in a sustainable management system. For the evaluation of sensory characteristics of lamb meat, quantitative descriptive analysis was performed, based on structural intensity scale of seven points (ISO 6564:1985). All Zackel meat samples had an overall acceptability, the most favorable being in Sjenica sheep, with detected differences between Sjenica and Vlashko Vitoroga sheep ($p<0.05$). Sustainable consumers appreciate sensory characteristics of lamb meat from agroecological farming system and prefer lamb meat as local food.

STR polymorphisms of a historical sheep breed, the Cikta

KOVÁCS, Endre[1] – TEMPFLI, Károly[1], – BECSKEI, Zsolt[2] – BALI PAPP, Ágnes[1] – GÁSPÁRDY, András[3]

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The population structure of the endangered Cikta sheep breed was evaluated by means of nine microsatellite polymorphisms. Seventy-two individuals from three flocks were sampled to determine genetic indices in the Hungarian population. Overall, average observed and effective allele numbers were 5.63 and 3.76, respectively. High values of expected heterozygosity (0.65-0.87) indicated outbred status. Discriminant analysis based on genotype frequencies revealed moderate genetic diversity among Cikta flocks, since only three loci (OarCP49, CSSM47 and OarHH41) contributed significantly ($P<0.05$) to differences between subpopulations. Low squared Mahalanobis distances from group centroids also confirmed that the breed is almost equally represented by the three flocks. Moderate level of diversity between flocks was attributed to the long-term effects of a population bottleneck dating back to the 1970s. Continuous microsatellite information is required for the preservation of rare alleles and diversity in Cikta sheep.

The Role of the Slovenian Autochthonous Drežnica Goat Breed in the Area of Sustainability of the Alpine Pasture and Alpine Dairy Farming

ŽAN LOTRIČ, Metka

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In Slovenia, there is only one conserved autochthonous breed of goat – the Drežnica goat. It is a critically endangered breed, consisting of approximately 750 goats. In terms of the purpose of rearing and its original location, two types of Drežnica goat were developed in the past: the dairy type in the Bovec area and the meat type in the Drežnica region. Still today, the Drežnica goat is in close connection with traditional farming practises such as seasonal Alpine dairy farming of the dairy Drežnica goat, whereas its meat counterpart is characterised by an even more specific way of farming practise that is unique to Slovenia. However, these traditional practices are in rapid decline. Therefore, it is necessary to precisely document and protect the variety of the Drežnica goat farming practises and to promote this valuable heritage for means of public awareness and relevant government institutions.

Prolactin genotype is associated with egg production in Hungarian Yellow hens

TEMPFLI, Károly – SZALAI, Klaudia – BALI PAPP, Ágnes

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Prolactin hormone has crucial roles in regulation of egg production, since broodiness is induced by elevated prolactin concentrations, which causes temporary suppression of the ovary, and interruption of laying. In the present study, 436 Hungarian Yellow hens were genotyped for the 24-base-pair indel in prolactin gene (*PRL*). Body weight measurements were taken biweekly from the day of hatching to 14 weeks of age, and egg production was monitored between 40 and 45 weeks of age. Average egg weight and egg production intensity was determined. Frequencies for *DD*, *ID*, *II* genotypes were 0.23, 0.48, and 0.28, respectively. *PRL* genotype associated ($P<0.05$) with egg production intensity, and had no effect ($P>0.05$) on body or egg weight in the monitoring period. The insertion (*I*) allele proved to be more beneficial for egg production, which is in agreement with the allele substitution pattern in several other breeds and crosses.

Comparison of two staining techniques of Oravka cock semen using specific markers by flow cytometry

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Cryopreservation of poultry genetic resources in the gene bank is necessary for the conservation of endangered species. The goal of this study was to compare two staining techniques (with and without DRAQ5 dye) for sperm viability and acrosome status. Heterospermic pooled semen from the Oravka cock line (n = 6) was diluted in a Kobidil^{+} extender and frozen in a cryoprotectant solution containing 8% glycerol (GL) in liquid nitrogen vapours before being plunged into the liquid nitrogen. Afterwards, quality of post-thaw spermatozoa using specific markers (DRAQ5, Yo-Pro-1, Sytox Green, PI and PNA) was evaluated. Our results showed significant differences ($P<0.05$) among the experimental groups (DRAQ5^{+}/PNA^{+} vs PNA^{+}, 9.76±3.35% vs 17.31±3.30%, DRAQ5^{+}/Yo-Pro-1^{+} vs Yo-Pro-1^{+}, 27.98±7.10% vs 8.87±0.82% and DRAQ5^{+}/SYTOX^{+} vs PI^{+}, 19.55±5.61% vs 29.67±3.99%). These differences may be due to various binding mechanisms of each marker tested. Therefore, the choice of a proper marker for a spermatozoa viability and acrosome status evaluation should be done carefully.

Determination of mineral composition and nutritional value of snail meat for human consumption cultivated in mini-paddock pen system

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In this study we aimed to prove the nutritional value of commercially raised *Helix lucorum* snails. The snails (N=100), collected from a farm operating by a mini-paddock pen system, were analyzed for macronutrient composition and mineral content of the edible portion. The percentage of crude protein, fat, ash and moisture, as well as levels of selected minerals were determined by automatic systems and electro thermal atomic absorption spectrometry after microwave digestion. Mean values were calculated and compared with the current dietary reference values according to EFSA. Results showed that snail meat is a good, low-fat source of protein. 100 g of snail meat can provide 17% of the daily calcium requirements, 18.5% of the phosphorus, 26% of the zinc, and double the requirements for copper. In conclusion, meat from farmed *H. lucorum* is a valuable source of essential nutrients and should be made accessible to a wider population.

Proximate and nutritional profile of raw and cooked of snail meat (*Helix lucorum*)

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[2]Istanbul University, Faculty of Aquatic Science, 34134 Istanbul, Turkey

Proximate content (dry matter, protein, fat, ash) and nutritional profile (pH, color, cooking loss, water holding capacity, tenderness, drip loss) of the edible portion of forty Turkish snails (*Helix lucorum*) were assessed in this study. Snails growing in natural conditions were collected in May of 2017 in region of Trakia valley, Bulgaria. Samples were taken from the meaty part of snails and were investigated. Proximate analysis was carried out following the methods of the Association of Official Analytical Chemists (AOAC), while nutritional profile was determined by cooking methods. The results from the analysis showed that snail meat is rich in protein (162.3±2.8 g) and low in both fat (20.5±0.2 g) and ash (1.05±0.3 g). The present work illustrates that the water holding capacity, the cooking loss after heat processing and drip loss were decreased. The results of this study have showed that snail meat (*Helix lucorum*) is good sources of protein and traditional cooking had not considerable effect on nutritional profile.

Phenotypic Characteristics of the Tsigai Sheep Breed in Vojvodina- North Serbia

DRAGIN, Saša[1] – PIHLER, Ivan[1] –KUČEVIĆ, Denis[1] – ZARUBICA, Baćo[1] – ŽARKOVIĆ, Ivan[1] – ĐURĐEV, Srđan[1] – ALHASANAT, Majed[2]

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[2]Petra Development and Tourism Region Authority (PDTRA), Petra, Jordan

Tsigai is an indigenous breed of sheep in AP Vojvodina (northern part of Serbia), with combined capacities, used for milk, wool and meat production. It originates from the Asia Minor sheep, and it has spread towards Eastern Europe. It is believed that first animals came to Vojvodina from Romania (also part of Austro-Hungarian Empire), in the eighteenth century, (KRAJINOVIĆ, 2006). Tsigai is a big breed of sheep, characterized with strong body consistency. The trunk is medium in size but deep, narrow and rectangular. The chest is deep and narrow. The withers are bit shorter than the loins and the spine line is straight. The head is medium in size, but quite narrow. Tsigai sheep have no horns (male animals rarely). The ears are large and often clumpy. The head and ears are covered with black or brown hair. The legs are long and strong, covered with black or brown hair. The body weight of adult ewes is 70-75 kg, while rams weigh 110-120 kg on average.

Research was conducted on 95 sheep (46 animals of regular variety (T) and 49 of Čoka variety (ChT)) on two farms. Following measurements were done: body mass, withers height, back height, rump height, length of the trunk, cannon bone circumference, length of the chest, depth of chest, width of the chest, chest circumference, length of the head, width of the forehead and length of the ears. The following indexes were calculated: Format index (length of the trunk/withers height) x 100 (111.67 for T and 110.53 for ChT; Chest index (chest width/depth of chest) x 100, (68.53 T and 62.13 ChT); Chest depth index (depth of chest/withers height) x 100, (45.75 T and 51.90 ChT); Body Compactness Index (chest circumference/length of the trunk) x 100, (124.24 T and 126.58 ChT); Massiveness index (chest circumference/withers height) x 100, (138.76 T and 139.77 ChT); Body mass index (body mass/withers height) x 100 (110.78 T and 90.33 ChT); Body height index (rump height/withers height) x 100, (96.13 T and 98.58 ChT); Leg length index (withers height - depth of chest)/withers height)) x 100, (54.24 T and 48.09 ChT); Bone mass index (cannon bone circumference/withers height) x 100, (12.76 T and 11.67 ChT); Head width index (max. head width/head length) x 100, (79.96 T and 62.12 ChT).

By observing all the absolute measures and calculations of the Tsigai, we can say that breed characteristics are: big size body, straight dorsal line, with chest relatively wide and long but not very deep, elongated and large head with big clumpy ears. Typical exterior is inclined to the type of sheep for meat production. Considering the fact that milk yield of that breed can reach 150 liters in the 6 months lactation, some varieties with lower bone mass index are suitable for dairying.

Early determination of gender in Siberian sturgeon (*Acipenser baerii*) using ultrasound and biopsy techniques

RUSENOV, Anton[1] – URKU, Cigdem[2] – ATANASOFF, Alexander[1] – ZAPRYANOVA, Dimitrinka[1] – NIKOLOV, Galin[3] – SPASOV, Dimitar[3]

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In total there are only 6 different species of sturgeon in the Danube River as 5 of them are critically endangered. Traditionally, the caviar on the market is comes from Beluga, Russian or Stellate sturgeons in compare with caviar from aquaculture which is often yield from Siberian sturgeon or hybrids. Determination of the gender in sturgeon is very important in fish farmers, as sex is one of the main factors that determine cultivating them for caviar or meat the future. One of the best noninvasive technique for maturation monitoring is ultrasound. In combination with invasive methods such as gonads histology and sex hormone analysis, it is possible with great credibility to be identify sex. On this matter we set an aim to study the early and precise gender determination of Siberian sturgeon. Gender of 600 sturgeon were identified through non-invasive examination was conducted in farm conditions. To avoid additional injury and to obtain normal ultrasound image, fish were manual fixed. The abdominal exams were done in dorsal recumbency using transabdominal two-dimensional echography (UProbe 3C Series, Sonostar Co., China). Gonadal biopsy was performed with ultrasonography guidance making it possible to perform the biopsy with one hand while holding the ultrasound probe with the other. Materials for histological observation were fixed in 10% neutral formalin solution and processed by classical histological techniques. Determination of gender was successfully performed in all sturgeons. The testis exhibited a moderate homogenous density, appearing echographically with moderate rough granular hypoechoic pattern. The ultrasound image of ovaries were distinguished from those of male sturgeon with the strongly heterogeneous and hypoechogenicity structure. Histological section of Siberian sturgeon testis' showed maturity stage V and female were at the pre-vitellogenic stage (Stage I). In conclusion, ultrasound examination, can be a powerful tool in early determining the gender of Siberian sturgeon (*Acipenser baerii*) and could help sustainable protection the species on future.