The realization of a semen cryobank of native turkey breeds is a valid tool for the conservation and safeguard of the avian biodiversity in Italy. The doses stored in the cryobank could be useful in improving the genetic variability within farms, in correcting any selection errors and in reducing inbreeding problems. Second funding is foreseen to increase its consistency in term breeds and donators.

P023

The use of principal component and linear discriminant analyses to assess differences among four alpine goat breeds

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The evaluation of local breeds' unicity and distinctiveness might help to find their sustainable role in the current and future markets. Thus, the purpose of this study was to verify (i) whether, based on body conformation, some alpine goat breeds could represent homogeneous groups, and (ii) if it was, therefore, possible to discriminate the breeds based on body measures. To this aim, 327 adult female goats belonging to the Bionda dell'Adamello (BA, n.: 192), Pezzata Mochena (PM, n.: 53), Verzaschese (VE, n.: 43) and Camosciata delle Alpi (CA, n.: 39) breeds were submitted to sixteen body measures (withers and croup height; trunk length; chest length, width, height, and circumference; croup length; croup width; shin circumference; head and ears width and length). The data were processed by means of multivariate analyses, through principal component (PCA) and linear discriminant analysis (LDA), both on the complete database (model 1) and on a reduced one (model 2) represented by a balanced number of animals for each breed, randomly selected. In the PCA, both models identified 5 main components that explained, 78% and 81% of the variance, in mod.1 and mod.2, respectively. The first 2 components explained 55% and 59% of the variance, respectively, and the most involved body measures, based on loadings contributions, were represented by chest width (0.34) and circumference (0.32) (mod.1) and by chest circumference (-0.33) and head width (0.51) (mod.2). Based on the results of the PCA, the a posteriori identification of the breeds led to distinguish two groups, one represented by BA and PM, and one by CA and VE. This result agrees with the geographical distribution of the breeds in the Alps (BA and PM in the eastern part, VE and CA in the western part). For LDA, the complete database was splitted into a training and a testing one (80:20). The coefficients of linear discriminant functions explained a higher quote of

variance (99%, given by 59%, 36% and 4%, respectively for LD1, LD2 and LD3) than PCA. Based on LD1 and LD2 and regardless of the model adopted, the breeds were gathered into three groups (a: PM; b: BA; c: VE and CA). The LDA allowed to discriminate BA and PM better than PCA. The external validation on testing animals allowed to confirm the identification of the four Alpine breeds taken into consideration; however, while in the testing set BA and PM goats were all correctly attributed by LDA, the VE and CA breeds were correctly attributed in 92.8% of the cases.

P024

Semen cryopreservation for ex situ management of genetic diversity in chicken: creation of the Italian Avian Cryobank

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The project 'Conservation of Biodiversity in Italian Poultry Breeds' (TuBAvI), MIPAAFT PSRN 2017–2020, was dedicated to the safeguard, conservation and improvement of Italian poultry genetic resources. The planning and implementation of the Sperm Italian Cryobank of Local Poultry Breeds was an important task within TuBAvI project and semen doses of chicken and turkey breeds were stored in 2020. Adult Bionda Piemontese (BP; $n = 25$) and Bianca di Saluzzo (BS; $n = 18$) roosters were housed at the Poultry Unit, Animal Production Centre, University of Milan (Lodi, Italy). After a semen collection training period, semen donors were selected and semen doses frozen in liquid nitrogen. Each day of collection, quantitative (volume, concentration) and qualitative (viability, motility, progressive motility, kinetic parameters) sperm parameters were measured. Semen doses were frozen according to the procedure developed for the *Gallus gallus* species in the previous years of the project and reported in the SOP of the Cryobank. In brief, semen was diluted in two different steps to 1 billion sperm/mL with Lake pre-freezing medium containing 2% N-methylacetamide final concentration, equilibrated at 5 °C for 1 min, loaded into 0.25 mL French straws, frozen for 10 min over a nitrogen bath at 3 cm of height and stored in liquid nitrogen at −196 ° C in cryogenic tank. The straws were thawed at 5 °C for 100 s and sperm quality was assessed. In total, 7 BP roosters and 6 BS roosters were selected as donors. The mean volume and sperm concentration recorded in fresh ejaculates of BP and BS were $0.25 ± 0.17$ mL and $3.77 ± 0.76$ billion sperm/mL, and $0.33 ± 0.11$ mL and $2.89 ± 0.62$ billion sperm/mL respectively. Semen quality of fresh samples was significantly different

between breeds. Higher values in sperm viability and motility were found in BP compared to BS semen, being viability 84.2% vs. 49% and motility 86.8% vs. 45.1%. As expected, a general significant decrease in sperm quality occurred after the freezing-thawing process and differences in sperm quality between breeds were no more present after thawing. The overall mean viability and motility values recorded after thawing were 16% and 17%, respectively. To date, the doses of frozen semen stored in the Italian Sperm Cryobank are 32 straws of BS and 67 straws of BP. A programme to store semen doses from further Italian poultry breeds was planned and will be implemented from 2021 to 2023.

P025

Parentage reconstruction using microsatellite markers in Valle del Belìce sheep breed

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In the sheep breeding sector, the use of parentage test represents an important tool to avoid pedigree errors, due to the flock size and the difficulty to effectively recognize the parents of each offspring. Pedigree errors reduce genetic progress, due to incorrect estimation of breeding values, with 10–23% of detected errors. Therefore, the parentage analysis conducted using microsatellites markers could improve the animal breeding programs reducing pedigree errors. The traditional mating system in Valle del Belìce sheep flocks was natural mating. Nowadays, in most farms, parentage records are based on the assumptions that the most probably father could be one of the selected rams used during mating seasons, and the most probably mother could be the one which suckle only their own lambs. All these reasons made pedigree errors notable increased. Microsatellite markers could define reliable parentage test to improve mating plans, reduce inbreeding, and maintaining genetic variability within Valle del Belice breed. A total of 23 microsatellites were chosen considering literatures and ISAG/FAO recommendations. Samples were collected from 4 flocks in Agrigento provinces and included 64 'offspring-mother' pairs, included 9 twin pairs, and a total of 23 rams. Summary statistics of 151 individuals showed mean number of alleles per locus was 10.087, observed and expected heterozygosity values were 0.672 and 0.723 (p-value <0.05), respectively. The mean Polymorphic Information Content (PIC) value was ~0.70. Results of maternity test showed that 68.75% of the recorded/assigned mothers were correct but only for the 45.45% of those, was possible to assign a father and then to construct the most probably trios. Moreover, out of 9 twin pairs, only three pairs could be genetically correct while the other ones suggested us to hypothesize the rare adoption phenomena, and the heteropaternal superfecundation already observed in several poly-ovulatory species with an incidence of 35%. All our results demonstrated the difficult reliability of pedigrees drawn up on documentary basis like the ones of Valle del Belice breed. Application of DNA-based parentage test has the potential to assist the farmers in improving pedigree records, resulting in increase of genetic improvement, and consequent reduction of random genetic drift and inbreeding depression.

P026

Morphometric differences based on quantitative traits between different genetic lines in the Merino Español sheep breed

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The different traditional genetic lines of the Merina breed have been zoometrically characterized. These lines have been formed over time, through a combination of selection by farmers who have been looking for a type of animal with certain morphological, productive and behavioral characteristics, selection at certain environmental conditions, and in some case the genetic derivative due to reproductive isolation. Some lines have been forming in the last 100–200 years (generations of closed mating) such as those of Maesso, Egea, Granda and López-Montenegro, some external animal have been introduced in the last 50 years in Hidalgo and Perales lines, and Nuevo Serena has formed more recently (in the last 30–50 years).

Zoometric measurements have been made in 292 adult females chosen randomly in the herds: Granda (60), Egea (21), Hidalgo (50), López-Montenegro (40), Maesso (40), Perales (46) and Nuevo Serena (35). Thickness compass, zoometric rod, a measuring tape and an analog dynamometer had been used. The following zoometric indexes were calculated: Body index (BI), Compactness index (CoI), Ilio-ischial index (II), Thoracic index (TI), Cephalic index (CeI), Proportionality index (PI), Shinbone load index (SI).

High morphological variability between these lines ($p < .001$, and high homogeneity within the line) were shown. According to