



ASPAS 25th Congress Book of Abstract

Pasquale De Palo

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Marion Girard, Agroscope (Switzerland)

Email: marion.girard@agroscope.admin.ch

Flaviana Gottardo, University of Padova (Italy)

Email: flaviana.gottardo@unipd.it

Andrea Minuti, "Sacro Cuore" Catholic University, Piacenza (Italy)

Email: andrea.minuti@unicatt.it

Gianluca Neglia, University of Napoli (Italy)

Email: neglia@unina.it

Anna Nudda, University of Sassari (Italy)

Email: anudda@uniss.it

Johan Osorio, South Dakota State University (USA)

Email: johan.osorio@sdstate.edu

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Email: fowlfeed@163.com

Italian Journal of Animal Science

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ASPA 25th Congress

Monopoli (BARI - ITALY), June 13-16, 2023

Guest Editors

**D'Alessandro Angela Gabriella, De Palo Pasquale, Maggiolino Aristide,
Mele Marcello**

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ASPA 25th Congress

Monopoli (BARI – ITALY), June 13–16, 2023

#ASPA2023

ASPA 25th Congress Book of Abstract

The 25th congress of the Animal Science and Production Association

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**Monopoli (BARI – ITALY),
June 13–16, 2023**

Venue

Torre Cintola Natural Sea Emotions

Località Capitolo – Monopoli (BARI – ITALY)

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Effect of *Hermetia illucens* meal on gilthead seabream (*Sparus aurata*) flesh sensory profile. An innovative approach using electronic senses and data fusion

Ambra Rita Di Rosa, Francesca Accetta, Rosangela Armone, Doriana Aliquò and Biagina Chiofalo

Department of Veterinary Sciences, University of Messina, Messina, Italy

Use of insects as alternative protein source for aquaculture feed production is an excellent example of circular economy. With the aim to evaluate the effect of fishmeal (FM) replacement with *Hermetia illucens* meal (HIM) in the diet of *Sparus aurata* farmed offshore on the organoleptic quality of fillets, two isolipidic (18%, as fed) and isoproteic (42% as fed) diets were tested at farm scale: a control diet with no HIM, and an experimental diet with 35% of HIM in substitution to FM. At the end of the trial, the organoleptic properties of fresh fillets from 12 fish per each group were evaluated using a sensor-based instruments platform consisting of E-eye, E-nose with 18 MOS sensors and a potentiometric E-tongue with 7 chemical sensors. The artificial senses platform was used to detect the organoleptic *fingerprint* of the fillets of the 2 groups (HIM vs. FM) in terms of color, volatile fraction and taste. For each instrument, all sensors data was analyzed by principal component analysis (PCA) to highlight similarities and differences between the groups; then, the pattern discrimination index and organoleptic distance (based on Mahalanobis distance), were calculated. PCA graphical representation of the E-eye and E-nose results showed nearly overlapping color and odor profiles of the 2 groups. The organoleptic distance and the pattern discrimination index between the 2 groups were for the color 5.39 and 3.88% ($p = 3.78$) and for the volatile profile 0.08 and 2.36% ($p = 0.08$), respectively. Instead, regarding the taste, the PCA of the E-tongue showed a clear distinction between the fillets of the FM and HIM groups and the first two principal components accounted for 94.61% of the variance. Specifically, the vector that mostly identified the fillets of the HIM group was the AHS sensor, particularly sensitive to astringency, while for the fillets of the FM group, the PKS, NMS and CTS sensors, respectively metallic, umami and salty taste indicators. The organoleptic distance and the pattern discrimination index were also significantly high (837.15 and 55.64% respectively; $p = 0.001$). The results highlighted that the diet with 35% of HIM meal in

substitution to FM influenced the taste of fillets confirming E-senses as powerful instruments for organoleptic evaluation.

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Cold shock by immersion in iced salty water is a suitable method to stun Carpio del Garda (*Salmo carpio*) both considering animal welfare and flesh quality during storage

Lina Fernanda Pulido-rodríguez^a, Giulia Secci^a, Maria Vittoria Tignani^a, Adja Medeiros^a, Filippo Faccenda^b and Giuliana Parisi^a

^aDipartimento di Scienze e Tecnologie Agrarie, Alimentari, Ambientali e Forestali, Università degli Studi di Firenze, Firenze, Italy

^bFondazione Edmund Mach/Centro di Trasferimento Tecnologico, San Michele all'Adige, Italy

The effect of the method of stunning/killing both on animal welfare and on quality of the final product is one of the most critical process that influences adenosine 5-monophosphate (ATP) depletion but also quality-related parameters such as pH, colour and water holding capacity (WHC). Despite the request of the European Commission to identify species-specific stunning systems, many works need to be done. Carpio del Garda (*Salmo carpio*) is a salmonid endemic of Lake Garda whose meat are highly appreciated. However, scarce are the studies aimed to investigate the effects of stunning methods on flesh quality. Seventy-two *Salmo carpio* (347.4 ± 68.9 g) specimens were randomly and equally sorted into three experimental groups (24 fish per treatment) based on the stunning method: (i) lethal dose of anaesthetic (AN, 400 mg/L MS-222), used as control; (ii) electrical stunning (ES, 24 V applied for 4 s); (iii) cold shock by immersion in iced salty water (ICE, 30 s at -3°C ; NaCl 35 ppt). ATP and related catabolites in muscle immediately after death were analysed to obtain ATP to inosine monophosphate (IMP) ratio; colour parameters, pH, water holding capacity (WHC), fatty acid profile, conjugated dienes and thiobarbituric acid reactive substances (CD and TBARS, respectively) were determined immediately after death and after a storage of 30, 60, and 90 days at -20°C . The results obtained from the statistical analysis (two-ways ANOVA) highlighted that the AN and ICE groups had higher ATP/IMP ratio (57.3 and 41.4, respectively), than ES (10.7). pH value of AN samples (6.5) was higher than the value found in ES fillets (6.32;

P140

Phenotypic characterization of an endangered indigenous goat: Comune di Sicilia ecotype

Luigi Liotta^a, Vincenzo Lopreiato^a, Annalisa Amato^a, Carmelo Cavallo^a, Cristina Tomasella^a, Arianna Bionda^b, Marco Scalisi^a and Vincenzo Chiofalo^a

^aDipartimento di Scienze Veterinarie, Messina, Italy

^bDipartimento di Scienze Agrarie e Ambientali, Produzione, Territorio, Agroenergia, Milano, Italy

Characterization of indigenous livestock species is the key to the development of proper strategies for long-term maintenance and use of genetic variation and for guidance in decisions about future utilization and conservation strategies. Comune di Sicilia goat, counts about 500 adults, is bred in western Sicily under low-input management systems and contributes significantly to the livelihoods of resource-poor farmers as a source of protein and income, thanks to its typical dairy products. It is known for its unique adaptive traits, such as heat and drought tolerance, and low disease susceptibility, which make it ideal for production under stressful environments. However, it has received little attention, and, in fact, it is not currently recognized as a breed but only as a local ecotype. The aim of this study was to phenotypically characterize the Comune di Sicilia goat so as to collect all data needed for drafting a breed standard, which, together with genotyping, would allow its official recognition. Phenotypic traits for 78 adult goats (9 males, 69 females) included body weight (BW); withers (WH), croup (CH), and chest height (CHH); chest (CL), length (TL), and croup length (CHL); chest width (CW), hip breadth (HB), and coxofemoral width (CXW); and chest (CC) and shin circumference (SC). Qualitative traits included coat color pattern and type, presence or absence of horns, ears and wattles. Age was estimated based on dentition. Analysis of the morphological descriptors showed some sexual dimorphism (BW: males 54 ± 5 kg, females 43 ± 8 kg; WH: males 75 ± 2 cm, females 71 ± 3 cm; TL: males 81 ± 5 cm, females 73 ± 6 cm; CC: males 102 ± 4 cm, females 82 ± 6 cm), but overall, all parameters showed very little variability. As regards qualitative traits, badger-face was the prevalent coat colour, and there were subjects without horns (50%), ears (5%), and wattles (55%). A relative homogeneity was observed in Comune di Sicilia goats, as well as peculiar phenotypical features, such as diluted pheomelanin and the presence of horns, which might represent environmental adaptive traits. This comes together with an effective population size big enough to be exploited for future breed improvement.

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P142

External egg quality from Siciliana, a native chicken breed of the Sicilian Region (Italy) reared under free range conditions

Ambra Rita Di Rosa^a, Francesca Accetta^a, Luigi Liotta^a, Doriana Aliquò^a and Vincenzo Chiofalo^b

^aDepartment of Veterinary Sciences, University of Messina, Messina, Italy

^bConsortium Research of Meat and Agribusiness Chain, Messina, Italy

Animal biodiversity is an important component of all sustainable agri-food systems. The valorisation of typical products also represents a strategy for the preservation of local breeds. Aim of this study, taking into account the visual criteria of consumer choice, was to evaluate the external characteristics of eggs from the endangered Siciliana (SI) chicken breed compared to Livorno (LI) pure breed and Lohmann white (LW) commercial hybrid ones. No. 63 eggs (21 for each group) were sampled from 3 flocks of 2 local Italian breeds (SI and LI) and 1 commercial strain of LW, all reared in different farm under organic conditions. The following external quality traits were evaluated: egg's weight, length, width, circumference, shape index, shell percentage, and shell index. Eggshell color was determined using a colorimeter (Minolta CM 500) and results were expressed using the CIE $L^*a^*b^*$ system color profile. Furthermore, the image of each egg-shell was acquired with a computer vision system (E-eye, Iris visual analyzer 400, Alpha MOS) and results were expressed using the RGB system color profile. E-Eye data were subjected to PCA analysis. As expected, the average weight of the 2 autochthonous breeds eggs was similar (SI = 56.80 g; LI = 61.23 g) and significantly ($p < 0.0001$) lower than LW eggs (70.33 g). Moreover, the width and circumference of SI group eggs (41.33 and 14.40 mm, respectively) were significantly lower than LI (43.39 mm; 15.04 mm) and LW (45.27 mm; 15.55 mm) groups; therefore, the shape index of SI group eggs (69.21%) was significantly ($p < 0.0001$) different from LW and LI (74.17% and 75.92% , respectively) groups. No significant differences were found for shell percentage and shell index. Regarding shell color, all parameters of SI group ($L = 91.88$; $a = -0.26$; $b = 10.29$) significantly differed ($p < 0.0001$) from LI ($L = 94.36$, $a = -0.87$, $b = 6.83$;) and LW ($L = 94.45$, $a = -0.61$, $b = 6.07$) groups. Results from E-eye showed 5 color codes (2184, 2439, 2455, 2456, 2712) founded only in eggshell of SI and the PCA plot has clearly separated the groups, showing SI at right side of the first component and LW and LI on the left one. Overall, the results, showing how the shape and color of the shell may characterise a breed directing consumers in their

choices, can be also taken into account for the conservation and characterisation of a native Sicilian breed.

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P162

Morphological description of Montanina cattle, an old Sicilian (Italy) indigenous ecotype

Vincenzo Chiofalo^a, Vincenzo Lopreiato^b, Annalisa Amato^b, Carmelo Cavallo^b, Marco Scalisi^b, Viviana Floridia^b and Luigi Liotta^b

^aConosrzio di Ricerca Filiera Carni e Agroalimentare, Messina, Italy

^bDipartimento di Scienze Veterinarie, Messina, Italy

Sicily is rich in animal biodiversity and boasts a great variety of indigenous cattle: Modicana and Cinisara, officially recognized, and Montanina, a local ecotype not officially recognized.

The aim of this research was to study the phenotype in a nucleus of 32 *Montanina* adult cows from 3 local farms, located in Nebrodi areas, to identify the peculiar phenotypic traits to create the breed standard. The morphology characterization was made with estimation of weight and with 10 body measurements (expressed in cm), such as Withers Height (WH), Body length (BL), Chest Height (CH), Chest Width (CW), Chest Length (CL), Chest Girth (CG), Rump Length (RL), Rump width Ileum (RW_IL), Rump width Ischium (RW_IS), Hock Girth (HG). The descriptive statistics were calculated for morphological variables and the morphological tips was established through Body Index (BI: CW/CH) and Chest Index (CI: BL/CG). Phenotypically the cows have a red overcoat with an overall black hair coat and a reddish stripe on the back. The horns are white with black tip and have an average length of 27.48 cm (medium – long size). The average values of body weight is 494.55 kg and the average of body measures are 129.3 (WH), 158.4 (BL), 71.2 (CH), 46 (CW), 81.9 (CL), 182.4 (CG), 50.8 (RL), 54.2 (RW_IL), 39.2 (RW_IS) show a variability and this is confirmed by BI index in which some cows are mesomorphs (50%) while other are dolichomorphs (50%). Despite variability, the animals have good skeletal and muscular development. According to CI index, the cows are all mesomorphs indicating a good conformation well adapted to mountain environment. In conclusion, our results show that the *Montanina* cow has adapted to the difficult local environment and will also be able to adapt to future climate changes. The phenotype, like the coat colour and horns, the shape and the body size makes it unique and different from the other breed present in the territory, but further studies will be conducted to investigate the genetic structure of *Montanina* breed.

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Management of Bagnolese sheep in Campania Region: animal and pasture characteristics

Serena Calabrò, Dieu Donné Kiatti, Alessandro Vastolo, Vincenzo Peretti, Marika Di Paolo and Francesca Ciotola

Department of Veterinary Medicine and Animal Production, University of Napoli, Napoli, Italy

The Bagnolese sheep, called Malvizza, is a Campania region native breed, with dual aptitudes. It stands out for its productions: lamb, prized for the tenderness of its meat, and milk, with a distinct dairy aptitude, transformed into the eponymous Pecorino cheese. The breed, the result of crossbreeding in which the somatic traits of the Barbaresca can be recognized, has about 7465 individuals and is mainly distributed in the Campania region in the Picentini mountains, Alburni, Vallo di Diano, and Sele plain, and marginally in the hills of Caserta and Benevento. The predominant type of breeding is semi-extensive pasture and feed supplementation is used during energy deficit periods (hot summer and winter); feeding of lambs, destined for replacement, consists exclusively of milk until they are 35–40 days old. The Project SAVEPEB has helped to collect updated information related to the management of this breed. It characterized the entire production cycle of pecorino Bagnolese to improve its competitiveness by implementing a specific quality workflow. Blood samples were collected for DNA bank and cytogenetic analysis from 97 female Bagnolese sheep. Every 15 days, milk samples were collected for the qualitative characterization. The average milk yield was 60.7 ± 17.1 liters/head calculated over 180 days of lactation, with an average fat content of 9.04 ± 1.2 % and protein content of 6.7 ± 0.5 %. Regarding pasture evaluation, representative forages were randomly collected in the identified grazed areas (No. 7 areas) during one year of collecting (No. 6 sampling from October to July). The botanical evaluation was carried out before drying and the samples were analyzed for chemical composition. Energy content was also estimated. Most of the grazing areas consist of legume grasslands or mixed natural pastures, where Leguminosae and Graminaceae families are equally distributed. Other species were also identified in variable quantity. Protein and energy content reach relatively high value in some forages, whereas fiber level appear slightly higher compared to other investigation on natural pasture in Mediterranean area. Protein and lignin resulted the most variable parameters, maybe due to the different phenological stage of the plants at the