

EVALUATION OF MILKING ATTITUDE AND MILK QUALITY IN NATIVE CIUTA SHEEP BREED



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INTRODUCTION



Pecora Ciuta is a small, local breed native to the Central Italian Alps.

Livestock activity involving native breeds is a fundamental means to support disadvantaged areas, limiting depopulation and abandonment of the territory, and all the related negative consequences on the environment, biodiversity, and landscape. In fact, local breeds are part of the original landscape, contributing to its maintenance through their grazing activities.

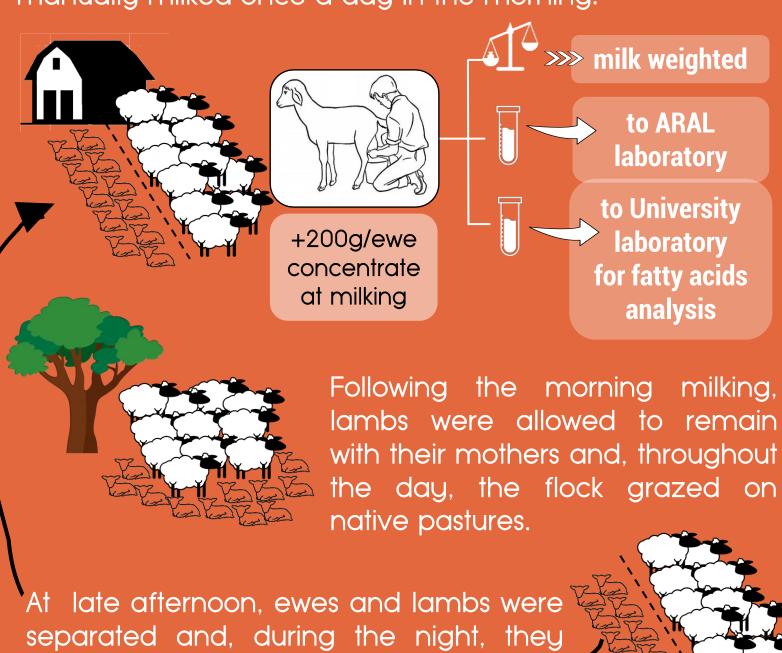
From this perspective, farming of local native breeds can provide numerous cultural, regulatory, and **ecosystem** services, in addition to contributing to local food supply. Although the productivity levels are lower compared to those from more specialized breeds, native breeds can offer multiple products due to their lack of specialization. These products often have unique qualitative characteristics which, if properly identified and promoted, can help creating added value for local supply chains.

Particularly, dairy products from native and not specialized sheep breeds have different nutritional quality compared to those obtained from cosmopolitan and specialized breeds. These differences primarily concern protein content and fat quality and are linked to numerous factors, such as the animal's genotype and its individual characteristics, but also the farming system and nutrition, which, in the case of native breeds, is predominantly *grass-based*.

Even if there is historical documentation of its traditional use for mixed-milk (cow, goat and sheep) cheese production, Pecora Ciuta is nowadays raised exclusively for meat production and there is no knowledge about ewe's milking attitude and milk quality features. As part of the VAL3CIUTA project, the aim of this study was to acquire, for the first time, a deep knowledge of Ciuta sheep milking attitude and milk quality features, with the further goal to lay the groundwork for initiating a local supply chain for the processing of Ciuta sheep milk.

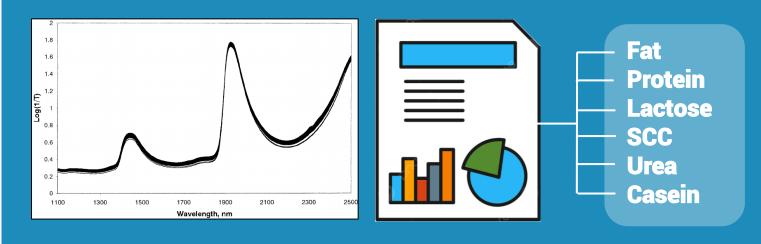
METHODOLOGY I

The experiment was conducted at one sheep farm located in Valtellina, Lombardy. A flock comprising 11 ewes and their lambs was utilized and housed in a single barn equipped with a catch feeder. The ewes were manually milked once a day in the morning.

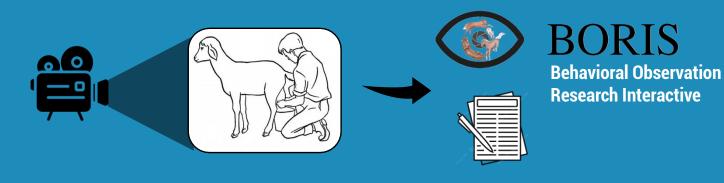


METHODOLOGY II

Individual milk production was recorded weekly and individual samples of milk were dispatched to the accredited laboratories of ARAL (Regional Association of Farmers) for compositional analysis, conducted in accordance with official methods (ISO 9622:2013, IDF141).

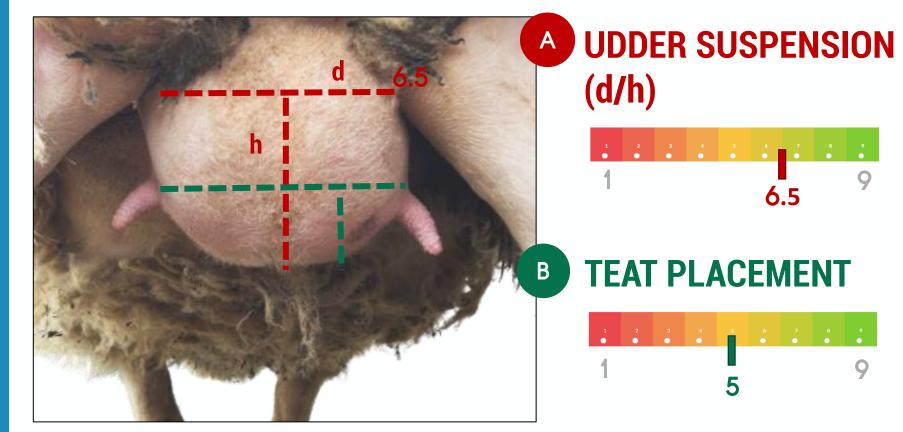


Sheep behaviour was recorded during milking sessions, aligning with the days designated for milk sample collection.



Udder conformation scores were documented for each ewe at the commencement, midpoint, and conclusion of the trial.

RESULTS



(d/h)

TEAT PLACEMENT

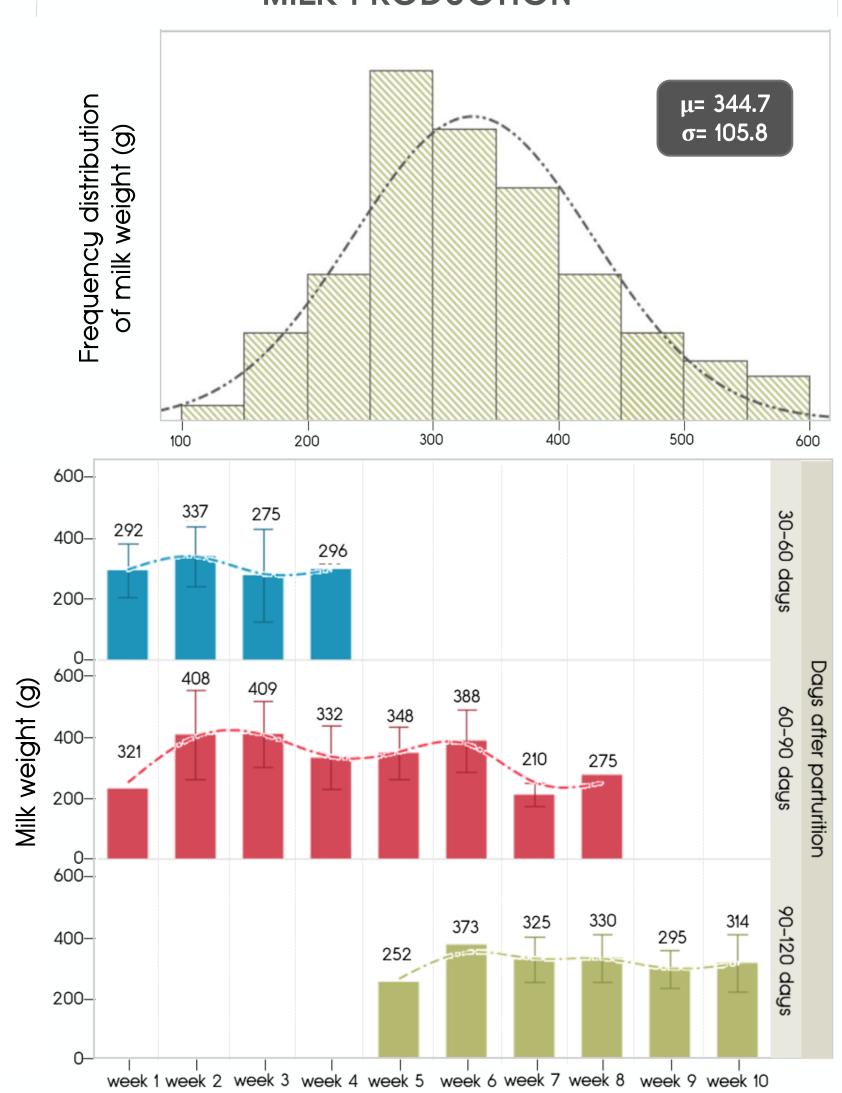
UDDER HEIGHT

UDDER CONFORMATION SCORE for each ewe

No correlations were found between conformation scores and milk yield or quality traits.

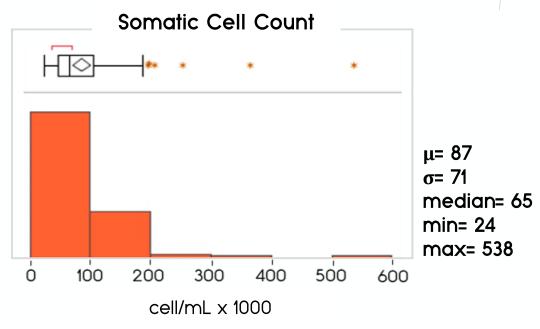
MILK PRODUCTION

were housed in shaded open pens.



MILK QUALITY TRAITS *p*=0.0005 p<0.0001 (g/100g) Fat (g/100g) 4.9 Lactose μ = 4.8, σ = 0.2 μ = 4.6, σ = 1.1 μ = 4.3, σ = 0.4 μ = 5.7, σ = 0.5 p=0.0006 p=0.0006 (b001/b) 4.5-(g/100g) 60-90 days 60-90 days 90-120 days 30-60 days 90-120 days Days after parturition Days after parturition

- Significant differences were detected in milk quality traits, including fat, lactose, protein and casein, among ewes at different days in milk.
- In all the milk samples analyzed, an evident inversion between fat and protein was observed, a phenomenon in which the fat percentage in milk falls below that of the protein. This outcome is very interesting because the reduction of milk fat, typical of the inversion, can lead to problems during milk processing, resulting in changes in the product's rheological and sensory qualities. The causes of the observed phenomenon could be multiple, including both genetic and managerial factors, mainly related to the feeding strategy. This includes the forage-to-concentrate ratio, the lipid content repercussions for farmers and the of the diet, and the digestibility of the fiber.



- SCC values were always lower than the suggested values of 250,000 cells mL⁻¹[ref] as hygienic parameter for considering healthy sheep mammary glands and good quality milk, with the exception for very few individuals in six sampling points*.
- Analysis on milk fatty acids profile and behavior at milking are still ewes' ongoing.

CONCLUSIONS

Results from this research are a complete novelty for the current conditions of the production reality under consideration. Further, they could represent an extremely valuable tool for supporting the promotion and enhancement of this versatile breed and its dissemination throughout the territory with positive entire local community.

