

RELIEFS ON THE ELECTRICAL CONDUCTIVITY IN SARDA MILK SHEEP IN THE LAZIO REGION - ITALY

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Introduction

The electrical conductivity measures the ability of the substrate to conduct electrical current and it is measured in mS/cm. Milk electrical conductivity change depend on alterations in the equilibrium of the ionic content, mainly due to the concentration of sodium, potassium and chloride. The electrical conductivity detection in the maximum flow during milking (ELHMF), can give further information of the udder health. The use of portable electronic milk flow-meter "Lactocorder," allows to record the production, the milk flow curves and the ELHMF during the milking (1). ELHMF average values reported for sheep milk are in the range of 3 and 6 mS/cm (2)(3). The aim of this study was to evaluate the ELHMF and its relation to production, somatic cells, chlorides and clotting properties.

Materials and methods

The study has been lead on 131 Sarda dairy ewes in various stage of lactation and parity, raised in five flocks of the provinces of Rome, Viterbo and Latina. Over a two months period (December and January 2006) 131 individual milk samples has been collected during the morning milking. The ewes were milked by machines. Milk production, milk flow traits and ELHMF has been recorded by the Lactocorder milk flow-meter. The number of somatic cells (SCC) were determined by opto-fluoro-electronic counter (Fossomatic 5000); chloride content by automatic titration (Mettler DL50) and renneting parameters like clotting time (R), curd firmness after 30 minutes (A30) and rate of clot formation (K20) by Formagraf (Foss-Electric). Statistical analysis has been performed by SPSS 12 base program. The SCC have been transformed in $\log_{10}$ in order to reduce the variability coefficient.



Results and Conclusions

The main milk flow traits were: milk yield per milking was 0.70 kg, average and maximum milk flow 0.66 and 1.04 kg/min, respectively. Milk ejection time was 0.91 min. while total milking time was 1.46 min. The ELHMF average value turned out from the current survey was 5.26 ± 0.04 mS/cm, in accordance with other authors (1). Table 1 shows the obtained average values.

Tab.1 - Descriptive statistics of the milk parameters

	Yield (kg)	ELHMF (mS/cm)	Log SCC (n° x ml)	Cl ⁻ (g/l)	R (min)	A30 (mm)	K20 (min)
Average±SEM	0.70 ± 0.03	5.26 ± 0.04	5.45 ± 0.06	0.93 ± 0.01	17.7 ± 0.6	39.3 ± 1.5	1.49 ± 0.06
Min. - Max	0.36-1.70	4.32-6.54	4.41-7.33	0.52-1.55	0.0-28.15	0.0-67.78	0.0-3.30
Median	0.67	5.20	5.26	0.93	18.65	44.20	1.45

Milk samples with ELHMF levels lower than 5.26 mS/cm (Tab.2) showed lower SCC and chloride average values, on the contrary they showed higher yield, clotting time (R), curd firmness after 30 minutes (A30) and rate of clot formation (K20) average values.

Tab. 2 - Average of ewes milk parameters in relation to electrical conductivity class

ELHMF class	N°	Yield	Log SCC	Cl ⁻	R	A30	K20
≤ 5.26	68	0.73	5.36	0.88	18.5	42.10	1.57
> 5.26	63	0.67	5.57	1.01	16.7	36.25	1.41

Significant correlation were found among ELHMF, number of somatic cells (Log SCC), chloride content (Cl⁻) and curd firmness after 30 minutes (A30). ELHMF had negative correlation with milk yield and A30; positive correlation were found with chloride content and log SCC (Tab.3).

Tab. 3 - Pearson correlation among ELHMF and other parameters

	Yield	Log SCC	Cl ⁻	r	A30	K20
ELHMF	- 0.13	0.37***	0.51***	- 0.03	- 0.28**	-0.14

* P<0.01, ** P<0.01, *** P<0.001

Milk electrical conductivity, recorded with Lactocorder milk flow-meter can be considered an useful parameter to evaluate individual milk yield, health status of mammary gland and milk clotting properties.

References

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