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Blood baseline values in female alpine and nera di verzasca goats reared in Italy.

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The Italian goat autochthonous breeds are appreciated for their milk and characteristics like the rusticity, frugality, fertility and longevity. Therefore the local goat breeds play an important role in the livestock sector, and it is important to guarantee sanitary strategies control, prevention or treatment of diseases. The hematological parameters in goats undergo changes in relation with many factors like breed, age (Piccione G. et al, 2014), physiological status, environment and stress (Waziri M.A. et al, 2010). Based on these differences it is necessary to establish appropriate physiological baseline values for every single breed in order to obtain a realistic evaluation of physiological or pathological status of the animal (Arfuso F. et al, 2016). The aim of this work was to evaluate the differences between a local goat breed (Verzasca) and a cosmopolite one (Alpine) from the hematological point of view, and to establish hematological reference values. A total number of 71 healthy female goats, of Alpine (n=37), and Verzasca (n=34) were enrolled for this study, for a total of 716 blood samples. All animals were reared together and exposed to natural photoperiod. Data were processed by a mixed model-repeated measures ANCOVA in order to evaluate the effects of breed, parity, and season while baseline values for each breed have been calculated by evaluating the 2.5-97.5th percentile of variables distribution.

The results showed that the breeds differ in a significant manner (Table 1). Verzasca goat shows significantly higher values in the erythroid parameters, whereas the Alpine goat shows higher mean values of leucocyte count and absolute neutrophil count. A further interesting result is the neutrophil lymphocyte ratio which is 0,96 in the Alpine and 0,57 in the Verzasca.

These results can add some knowledge to the definition of the health status of the two breeds, evidencing some environmental and physiological variation mechanisms.

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Table 1: Hematological parameters in the two breeds of goats. SD-standard deviation; † p<0.001 difference between breeds. Slopes and their statistical significances as a function of time in years are reported, as well as random factor significances. *p<0.05; **p<0.01; ***p<0.001.

	Alpine		**Verzasca**		**Age effect, slope**		**Subject effect**
Variable	Mean	SD	Mean	SD	Alpine	Verzasca	
RBC (M/µl)	12.95†	1.85	14.37	1.35	-0.080	-0.320***	
HGB (g/L)	86.60†	13.10	96.60	9.70	-0.400	-2.500***	
PCV (%)	0.25†	0.03	0.27	0.03	0.001	-0.005***	
MCV (fl)	19.72†	1.96	19.08	1.76	0.173**	0.129**	
MCH (pg)	6.70	0.53	6.74	0.46	0.044**	-0.026*	
MCHC (g/dl)	34.20†	3.19	35.51	3.09	-0.062	-0.359***	
RDW (%)	32.76†	4.80	34.91	4.27	-0.357**	-0.757***	
WBC (10^6/L)	8.60†	3.15	5.95	2.25	-0.365***	-0.491***	
NEU (10^6/L)	3.26†	2.07	1.80	1.11	-0.020	-0.061*	P<0.05
LYMPH (10^6/L)	4.59	2.24	3.66	1.73	-0.327***	-0.399***	
MONO (10^6/L)	0.47	0.44	0.28	0.19	-0.031**	-0.012**	
EOS (10^6/L)	0.24	0.22	0.17	0.17	0.014*	-0.021***	
BAS (10^6/L)	0.08	0.06	0.05	0.04	-0.001	-0.001	
NEU (fraction)	0.37	0.15	0.30	0.12	0.015***	0.016***	
LYMPH (fraction)	0.53	0.17	0.61	0.13	-0.019***	-0.017***	
MONO (fraction)	0.06	0.05	0.05	0.04	-0.003	0.002	
EOS (fraction)	0.03	0.03	0.03	0.03	0.003***	-0.002	
BAS (fraction)	0.01	0.01	0.01	0.01	0.001	0.005*	
N/L	0.96	1.63	0.57	0.38	0.053**	0.051***	

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