



Evaluation of milk production and some blood parameters in lactating autochthonous goat extensively reared in Molise region

D. Casamassima, M. Palazzo & R. Pizzo

To cite this article: D. Casamassima, M. Palazzo & R. Pizzo (2007) Evaluation of milk production and some blood parameters in lactating autochthonous goat extensively reared in Molise region, Italian Journal of Animal Science, 6:sup1, 615-617, DOI: [10.4081/ijas.2007.1s.615](https://doi.org/10.4081/ijas.2007.1s.615)

To link to this article: <https://doi.org/10.4081/ijas.2007.1s.615>



Copyright 2007 Taylor & Francis Group LLC



Published online: 15 Mar 2016.



Submit your article to this journal [↗](#)



Article views: 84



View related articles [↗](#)



Citing articles: 3 View citing articles [↗](#)

Evaluation of milk production and some blood parameters in lactating autochthonous goat extensively reared in Molise region

D. Casamassima, M. Palazzo, R. Pizzo

Dipartimento di Scienze Animali, Vegetali e dell'Ambiente.
Università del Molise, Campobasso, Italy

Corresponding author: Donato Casamassima. Dipartimento di Scienze Animali, Vegetali e dell'Ambiente. Facoltà di Agraria, Università del Molise. Via De Sanctis sn, Campobasso, Italy - Tel. +39 0874 404704 - Fax: +39 0874 404855 - Email: casamassima.d@unimol.it

ABSTRACT: The trial, lasted 7 months and was performed on 60 lactating autochthonous goat populations (Montefalcone and Valfortorina) extensively reared in Molise Region. Goat milk yield and composition, and pasture chemical and floristic composition were recorded monthly. At the beginning (30d), at half (105d) and at the end (210d) of trial body weight and body condition score (BCS) were recorded; besides jugular blood samples were taken at 30, 105 e 210 d to determine the following parameters: glucose, total protein, albumin, urea, triglycerides, total and HDL cholesterol, NEFA, calcium, magnesium, sodium and potassium. The two populations showed a milk yield of 275 kg e 258 kg (Montefalcone e Valfortorina goat, respectively) throughout 180 days of lactation, which was similar or higher than mean milk yield of other goat breeds (Sarda, Ionica, Argentata dell'Etna). BCS increased significantly ($P<0.01$) during lactation in both populations. Blood parameters displayed significant changes ($P<0.01$) during the trial in Montefalcone goat for glucose, albumin, urea, triglycerides, total and HDL cholesterol, NEFA, sodium and potassium instead Valfortorina goat showed significant differences in total protein, urea, total and HDL cholesterol, NEFA, magnesium, sodium ($P<0.01$) and albumin and potassium ($P<0.05$). In both population, milk yield and quality showed promising results for autochthonous goats preservation.

Key words: Milk production, Blood parameters, BCS, Autochthonous goat populations.

INTRODUCTION – Goat extensive system has an important social and economic role in emphasizing marginal areas due to goat's particular ability for browsing poor pasture in dry environments giving high biological value products (Decandia *et al.*, 2005). Local breed recovery from risk of extinction can represent a strategic way for genetic resources conservation and for animal biodiversity preservation and local products valorization (Zervas *et al.*, 1999; Matassino, 2000). During years, breeders demand of high productive races resulted in a dramatic reduction of autochthonous animal resources. Costumers' demand of regional food, obtained with traditional rearing system, suggests a new way for sustaining low consistency breed (Pietrolà *et al.*, 2006). In relation to animal germoplasm preservation from extinction, aim of the research was to study the productive performance of two autochthonous goat populations extensively reared in Molise, Montefalcone and Valfortorina, by evaluating milk yield and quality and blood parameters during lactation.

MATERIAL AND METHODS – The trial, lasted 7 months and was performed on 60 lactating autochthonous goat extensively reared in Molise Region, Montefalcone and Valfortorina goat. The goats, aged 3-6 years, 49.1 ± 2.1 kg e 52.3 ± 1.6 kg respectively, were monitored for milk and blood parameters throughout lactation (180 d). Milk yield was recorded monthly and individual milk samples were analyzed for pH, fat, protein, lactose and SCC. Pasture samples were randomly taken every month to assess chemical and floristic composition (fodder crops, fodder grass and other species). Body weight and body condition score (BCS) were recorded and jugular blood samples were taken, on fasting animals, at the beginning, at half and at the end of the trial to assess the concentration of the following parameters: glucose, total protein, albumin, urea, triglycerides, total and HDL cholesterol, NEFA, calcium, magnesium, sodium and potassium. Data were submitted to analysis of variance using SPSS (SPSS, Inc. Chicago, IL) GLM procedure, having animal within population as an error term. Differences among means at 30, 105 and 210d were tested by Scheffé test.

RESULTS AND CONCLUSIONS – Milk yield, in 180 d of lactation, was satisfactory in both groups with 275 ± 60 kg for Montefalcone goat and 258 ± 51 kg for Valfortorina goat (Table 1). Milk production was comparable with that of other autochthonous goat breeds and population reared in Southern Italy (AIA, 2005). Milk protein, fat and lactose contents were similar to those found in the milk of Garganica, Maltese and Saanen goat (AIA, 2005); in relation to a low SCC, a health milk was produced for mammary disease absence. Persistency in milk production was 72.95% and 73.35% in Montefalcone and Valfortorina goat, respectively, and was linked, probably, to an uneven amount and quality of pasture, as suggested by Sampeyalo *et al.* (1998). Eknaes *et al.* (2006), in similar studies, showed that milk composition is reduced by negative energetic balance due to pasture availability and that SCC increased when the quality of pasture lowered (Hussain *et al.*, 1996). Animal grazing can be affected by nutritional unbalance with variation in milk production and quality characteristics such as fat, protein and flavour, and cheese yield (Fedele, 2002).

Table 1. Milk yield and quality of Montefalcone and Valfortorina goat.

Parameters		Montefalcone goat		Valfortorina goat	
		Whole trial	SD	Whole trial	SD
<i>Animals</i>	<i>n</i>	30		30	
Milk yield	kg	275	60	258	51
Protein	%	3.64	0.38	3.59	0.41
Fat	%	4.46	0.36	3.97	0.42
Lactose	%	4.62	0.31	4.63	0.26
SCC	log	5.51	0.43	5.59	0.44
pH	n	6.66	0.05	6.66	0.06

Blood concentrations of glucose, albumin, urea, triglycerides, total and HDL cholesterol, NEFA, sodium and potassium (Table 2) displayed significant changes (P<0.01) throughout lactation in Montefalcone goats, while Valfortorina goats showed significant differences in the concentrations of total protein, urea, total and HDL cholesterol, NEFA, magnesium, sodium (P<0.01), and of albumin and potassium (P<0.05). Some results from Valfortorina goats are consistent with those of Noè *et al.* (2004). These authors found in grazing goats an increase of total protein and urea in relation to a greater energy and protein content of pastures and to goat ability to select palatable and young plants. Table 2 shows a NEFA increase in the first lactation months in both groups, which can be associated with corresponding energy deficit as showed by Khaled *et al.* (1999) in dairy goats.

Table 2. Blood parameters in Montefalcone and Valfortorina goat.

Parameters		Montefalcone goat			SE	Valfortorina goat			SE
		30d	105d	210d		30d	105d	210d	
<i>Animals</i>		30	30	30		30	30	30	
Glucose	mmol/l	3.6 ^A	4.1 ^B	3.3 ^C	0.85	3.3	3.5	3.4	0.49
Total protein	g/l	81.4	80.6	79.9	0.05	76.0 ^{Aa}	79.4 ^b	80.2 ^B	0.05
Albumin	g/l	34.0 ^a	35.0 ^A	31.8 ^{Bb}	0.04	34.3	34.8 ^a	32.3 ^b	0.04
Urea	mmol/l	5.6 ^A	4.5 ^B	5.2	0.73	6.3 ^A	6.4 ^A	7.7 ^B	0.84
Triglycerides	mmol/l	0.17 ^A	0.23 ^B	0.28 ^C	0.62	0.26	0.25	0.24	0.42
Tot cholest.	mmol/l	2.1 ^A	1.8 ^B	1.8 ^B	1.25	2.3 ^A	1.7 ^B	1.8 ^B	1.50
HDL cholest.	mmol/l	0.65 ^A	0.54 ^B	0.62	0.54	0.72 ^A	0.54 ^B	0.56 ^B	0.58
NEFA	mmol/l	0.23 ^A	0.32 ^B	0.23 ^A	0.01	0.24 ^A	0.32 ^B	0.23 ^A	0.01
Calcium	mmol/l	2.2	2.2	2.2	0.03	2.2	2.2	2.2	0.04
Magnesium	mmol/l	1.02	0.99	1.06	0.02	0.98 ^A	0.99 ^a	1.03 ^{Bb}	0.02
Sodium	mmol/l	154.2 ^A	147.4 ^B	150.8 ^C	0.49	149.3 ^a	148.8 ^A	151.6 ^{Bb}	0.36
Potassium	mmol/l	4.7 ^A	4.4 ^B	4.4 ^B	0.04	4.1 ^a	4.4 ^b	4.4 ^b	0.04

In the same row for each breed, means followed by different letters are significantly different at P<0.01 (A,B,C) or at P<0.05 (a,b,c).

BCS increased significantly ($P<0,01$), in both groups, during lactation (Table 3) according to findings of Cabiddu *et al.* (1999) in goats reared on Mediterranean pastures providing satisfactory grass amount.

Table 3. BW and BCS in Montefalcone and Valfortorina goat.

Parameters	Montefalcone goat					Valfortorina goat					
	30d	105d	210d	mean	SE	30d	105d	210d	mean	SE	
<i>Animals</i>	<i>n</i>	30	30	30	30	30	30	30	30		
BW	kg	48.17	48.78	50.28	49.07	0.770	51.68	52.20	52.95	52.28	0.760
BCS	n	2.06 ^A	2.14 ^a	2.24 ^{ab}	2.15	0.017	1.95 ^A	2.08 ^B	2.24 ^C	2.09	0.020

In the same raw for each breed, means followed by different letters are significantly different at $P<0.01$ (A,B,C) or at $P<0.05$ (a,b,c).

Montefalcone pasture (Table 4) was richer in Leguminosae (35.3 vs 29.6%) and other species (20.5 vs 12.4%) if compared to Valfortorina pasture which was richer in Graminaceae (58.0 vs 44.2%). Herbage protein quality is very important because intake and preference for fodder crops affects milk protein, lipid and flavours. This is mainly prevalent in early spring and summer, due to the bloom of aromatic species enriched in volatile components (Bosset *et al.*, 1999).

Table 4. Floristic composition in Montefalcone and Valfortorina pasture.

Locality	Montefalcone goat			Valfortorina goat		
	Leguminosae	Graminaceae	Other species	Leguminosae	Graminaceae	Other species
%	35.3	44.2	20.5	29.6	58.0	12.4

Concerning the yield and quality of milk, which were similar or higher than those recorded in other goat breeds, the preservation from extinction of autochthonous population may be a good strategy for assuring the economic survival of marginal areas.

The research was supported by PRIN 2004 (MIUR ex 40%).

REFERENCES – **AIA** – Associazione Italiana Allevatori 2005. Controlli della produttività del latte in Italia 2004. Statistiche ufficiali, ATEL Roma. **Bosset** J.O., Jeangros B., Berger Th., Butikofer U., Collomb M., Gauch R., Lavanchy P., Seehovic J., Troxler J., Sieber R. 1999. Comparaison de fromages a pate de type Gruyere produits en regions de montagne et de plaine. Revue Suisse Agric., 31: 17-22. **Decandia** M., Molle G., Pinna G., Cabiddu A., Yiakoulaki M. 2005. Comportamento alimentare ed ingestione di capre al pascolo su macchia mediterranea. In: G. Pulina. L'alimentazione della capra da latte. Ed. Avenue Media, Bologna, 173-207. **Eknæs** M., Kolstad K., Volden H., Hove K. 2006. Changes in body reserves and milk quality throughout lactation in dairy goats. Small Rumin. Res. 63: 1-11. **Fedele** V. 2002. Alimentazione, tra pascolo e integrazione. Qualità di latte e formaggio. Caseus, anno VII 3: 36-43. **Hussain** Q., Havrevell O., Eik L.O. 1996. Effect on type roughage on feed intake, milk yield and body condition of pregnant goats. Small Rumin. Res. 22: 131-139. **Matassino** D. 2000. Recupero del genoma delle razze in via di estinzione e sviluppo ecocompatibile. Atti Conv. Naz. "La valorizzazione delle produzioni agricole e zootecniche locali per la promozione del benessere", Città di Castello (PG), 2 gennaio. L'Allevatore 56: 10-15. **Noè** L., D'Angelo A., Gaviraghi A. 2004. Alpeggio di gregge caprino: osservazioni sul profilo metabolico. In: Il sistema delle malghe alpine: aspetti agro-zootecnici, paesaggistici e turistici. Quaderni SoZooAlp 1: 190-194. **Pietrolà** E., Pilla F., Maiorano G., Matassino D. 2006. Morphological traits, reproductive and productive performances of Casertana pigs reared outdoors. Ital. J. Anim. Sci. vol. 5: 139-146. **Sanz Sampeyalo** M.R., Amigo L., Ares J.L. 1998. The use of diets with different protein sources in lactating goats: composition of milk and its suitability for cheese production. Small Rumin. Res. 31: 37-43. **SPSS**. 2005. **SPSS** per Windows, vers. 10.0.7. SPSS. Inc. Chicago, IL (USA). **Zervas** N., Hadjigeorgiou I., Zabeli G., Koutsotolis K., Tziola C. 1999. Comparison of grazing-with an indoor-system of lamb fattening in Greece. Liv. Prod. Sci., 61: 245-248.