

Supplementation of Diets for Lactating Goats with Selenium and Vitamin E

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It is well documented in animal nutrition that Selenium and vitamin E deficiency are often associated with increasing somatic cell count in milk and a higher incidence of mastitis (Smith *et al.* 1997). Selenium and vitamin E play important and synergistic roles in maintaining udder health and guarantees high milk yields (Bufano *et al.* 1994). The supplementation is important when animals are fed on diets poor in Selenium and vitamin E, if feeds are wrongly stored or forage obtained from soils low in Selenium (Jukola *et al.* 1996). The aim of this research is to evaluate the effect of Selenium and vitamin E on milk yield, rheological properties, somatic cell content and coagulation ability of milk from lactating goats.

Forty lactating Jonica goats raised in permanent stalls were studied for 120 days (September-December). After weaning their kids at 40 days after birth, the goats were divided into two homogeneous groups matched for number of lactations, number of kids and preliminary data on milk production. The first group (Control) were fed 500 g/ha.day of a pelleted diet without vitamin-mineral premix and formulated according to Pulina *et al.* (1992). The second group (Treatment) were fed on the same pelleted diet, but containing 1% of a vitamin-mineral premix that provided 0.16 mg of Selenium (sodium selenate) and 20 mg of vitamin E (91% of α -tocopherol). Data recorded on milk yield were obtained every two weeks and milk samples were analyzed for protein, fat, lactose (Milkoscan 255; Foss Electric) and somatic cells content (SCC) (Fossomatic 250; Foss-Electric). The three coagulation parameters were determined on milk samples: rennet clotting time (*r*), curd firming time (K_{20}) and curd firmness (A_{30}). SCC was expressed in Linear Score (LS = \log_2 SCC/12500) according to Ali and Shook (1980).

Table 1. Milk yields, composition and qualitative characteristics and coagulation parameters of Jonica goats

	Milk yield (mL/ha.day)	Fat (g/kg)	Protein (g/kg)	Casein (g/kg)	Lactose (g/kg)	CCS LS(log ₂)	<i>r</i> (min.)	K_{20} (min.)	A_{30} (mm)
Control	1399.22 ^b	40.43	37.54	30.30	46.51 ^b	4.97 ^A	16.55 ^a	5.07 ^a	32.86 ^b
Treatment	1505.34 ^a	40.81	36.61	29.83	48.32 ^a	3.39 ^B	13.34 ^b	4.23 ^b	34.20 ^a
s.e.	179.11	3.91	3.44	2.53	1.72	1.60	4.01	3.26	4.36

^{a, b} P < 0.05; ^{A, B} P < 0.01

Data on milk yield, composition and CCS demonstrated that Jonica goats fed supplemented Selenium and vitamin E diet, resulted significantly higher milk production (P<0.05) and lactose content (P<0.05) than goats in the Control group (Table 1). Milk samples from the Treatment group showed a low CCS compared with the Control group (P<0.01). Rennet clotting time (*r*) and curd firming time (K_{20}) of the Treatment group were lower in goats from the Treatment group (P<0.05), whereas curd firmness (A_{30}) was significantly higher (P<0.05) than in the Control group.

Goats supplemented with Selenium and vitamin E diet attained a higher average daily milk production per head (~100 mL) with the lowest SCC than did unsupplemented goats and their milk had the best rheological properties. The present research supports the view that Selenium and vitamin E have an important role in the milk production of stall-fed goats by promoting higher milk production of improved quality.

Ali, A.K.A. and Shook, G.E. (1980). *J. Dairy Sci.* **63**: 487.

Bufano, G., Dario, C. and Laudadio, V. (1994). *Proc. Int. Symp. Somatic cells and milk of small ruminants*, Bella (PZ), Italy

Jukola, E., Hakkarainen, J., Saloniemi, H. and Sankari, S. (1996). *J. Dairy Sci.* **79**: 831.

Pulina, G., Rossi, G., Cannas, A., Brandano, P., Rasso, S.P.G. and Serra A. (1992). *Proc. 43th Meeting EAAP*, Madrid.

Smith, K.L., Hogan, J.S. and Weiss, W.P. (1997). *J. Anim. Sci.* **75**: 1659.

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