



Nitrogen impact in grazing dairy farms



C. Silva¹, T. Dentinho² and A. Borba³

¹SRAF, SDAT, Vinha Brava, 9700 Angra Heroísmo, Portugal, ²EZN, Fonte Boa, 2000 Santarém, Portugal, ³Universidade dos Açores, Terra Chã, 9700 Angra Heroísmo, Portugal

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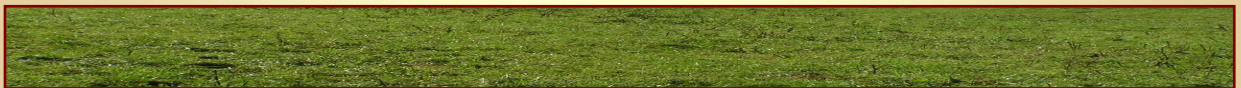


Milk production, based on an annual rotation grazing system, is the pillar of the economy of the Azorean primary sector. In the last few decades there has been a trend towards more intensive dairy farming system, that uses larger stocking rates and has higher production levels. This intensification poses potential risks for environmental conservation.

This work studied the problematics of nitrogen and urea output in milk, in 15 milk farms of Terceira Island (Azores, Portugal). The kinetic of the ruminal degradation of dry matter (DM) and crude protein (CP) in pastures with 4 different levels of protein (14.9; 19.1; 22.9 and 26.9%) were also studied. Three levels of nitrogen fertilization were used: low – Less than 40 units, medium - between 40 and 75 units and high- more than 75 units. The stocking rates were 1.7, 1.8 and 2.0 cows/ha and productions per cow/year of 5492, 6289 and 6336 kg for the low, medium and high levels, respectively.

Dairy Farms Characterization

	Fertilization levels		
	Low	Medium	High
UAS (ha)	19.3	21.00	27.0
Stocking rates (CN ha ⁻¹)	1.7	1.8	2.0
Concentrate per cow (kg/dia)	175	169	240
Concentrate/ Milk kg (g)	320	367	326
Cutting interval (dias)	33.71	26.35	23.87
Milk production in the trial period (kg)	76 521	86 726	124 086.5
Milk production per cow/year (kg)	5 492.4	6 289.3	6 336.0



Chemical composition of the pastures

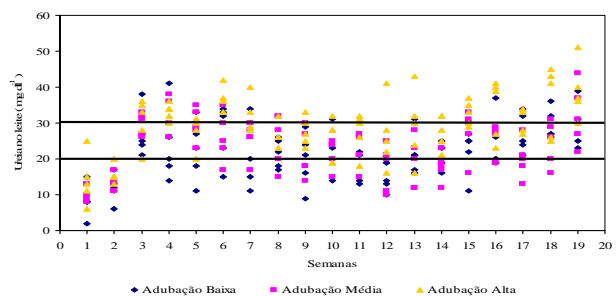
Fertilization level	DM (%)	DM Yield kg ha ⁻¹	100 g DM					
			CP	NDF	ADF	ADL	Ash	EE
Low	16.9	5473.7	20.31	55.12	31.48	2.96	10.05	2.48
Medium	15.2	5758.9	24.28	52.47	30.24	3.22	11.08	2.66
High	16.0	5895.2	25.07	55.92	30.84	2.95	10.03	2.86



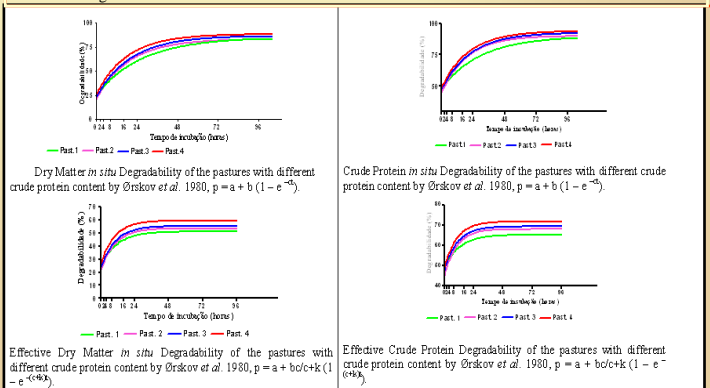
Milk Urea for the three fertilization levels

Fertilization level	MUN (mg 100 ml ⁻¹)
Low	10.18
Medium	10.77
high	13.54

The results of CP in pastures were 20.3, 24.3 and 25.1%. Significant differences were observed ($p < 0.05$) among the results of milk urea for the high level of fertilization (29.0%), in relation to the medium level (23.1%) and the low level (21.8%).



The relationship between the excellent urea levels in milk with the gotten ones during the trial for the three levels of nitrogen fertilization.



Effective Dry Matter *in situ* Degradability of the pastures with different crude protein content by Ørskov *et al.* 1980, $p = a + b(1 - e^{-kt})$.

Effective Crude Protein Degradability of the pastures with different crude protein content by Ørskov *et al.* 1980, $p = a + b(1 - e^{-kt})$.

In this study it was concluded that the nitrogen fertilizations leads to higher values of pasture CP and milk urea, however, no significant difference was found among the amounts of nitrates and ammonia in the soil.