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Presenter Information

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Nutritional parameters of grazing calves in milking phase 2 : protein metabolism

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Key words : calves milking grazing ,protein supplement ,nutritional parameters

Introduction Approximately 95% of the beef production in Brazil came from grazing animals .Despite this ,there are a small number of studies about the physiological effects of the interaction between pasture conditions ,animal life phase and fed supplement .Protein supplementation has been the main tool used to increase the productive capacity of animals because it potential to also increase the energy input to the animal ,when improving the pasture digestibility .In young bovine ,however , little has been studied about the adequate protein levels in the supplement in order to increase animal performance ,without allowing that protein excess in the diet could lead to waste and even environmental problems .The excess protein in bovine diet is metabolized by the liver ,transformed into urea ,and then eliminated into the urine ,could to form potentially water-polluting compounds .The objective of this study was to evaluate the responses of the protein metabolism of grazing nursing calves to different protein levels supplementation in tropical pastures in Brazil .

Materials & Methods This work was carried out in the region of Viçosa ,MG ,Brazil .A total of 52 Nelore beef calves with initial age of 100 days and initial weight of 129 kg were used in the study .The animals with their mothers were separated into four groups that received different concentrate supplement in a " Creep-Feeding" system .The animals were raised in *Brachiaria decumbens* Stapf pastures .The evaluated supplements were : *ad libitum* mineral salt (control treatment) ,and rations with 8 ,22 and 32% of crude protein (CP) formulated with corn and soybean meal ,daily fed at 1.2 kg/animal . The pastures were sampled every 28 days (McMeniman ,1997) .On the 65th day of the experiment ,spot urine samples were collected to determine the daily urea excretion as suggested by Valadares et al .(1999) .Immediately after urine collection ,blood samples were collected from each animal ,centrifuged and analyzed for plasmatic urea level .The significance level used was 5% .

Results & Discussion Supplementation with concentrated rations with up to 22% of CP had no effect on the plasmatic urea or N-urea levels (Table 1) .However ,concentrated supplements with 32% of CP increased plasmatic urea levels .This can be explained by an action of the liver that ,seeking to metabolize a possible excess of diet protein ,increases the urea production . This urea is carried ,through blood ,to the kidneys and eliminated from the body via urine .Although the differences observed in daily urea excretion in the urine (expressed as total excretion per day or per kg of live weight) are not significant ,the supplementation with rations with 32% of CP produced up to 50% more urea excreted via urine .

Table 1 Levels and coefficient of variation of plasmatic urea (PU) and N-urea (PNU) ,and daily excretion of urea in total urine (UU) and per kg of live weight (UULw) .

	Level of Protein in Supplements ¹				CV (%)
	Salt	8% CP	22% CP	32% CP	
PU ²	25.04 ^b	20.73 ^b	23.69 ^b	35.69 ^a	37.9
PNU ²	11.67 ^b	9.66 ^b	11.04 ^b	16.63 ^a	37.9
UU ³	16.25 ^a	18.21 ^a	16.91 ^a	25.03 ^a	59.9
UULw ⁴	90.69 ^a	95.18 ^a	89.66 ^a	121.60 ^a	47.3

¹ Means in the same row followed by the same letter are not significantly different by the *t* test ($p < 0.05$) ; ² mg/dl ; ³ g/day ; ⁴ mg/kg LW/day .

Larger urine excretions of this metabolite were expected because of the largest plasmatic urea levels in these animals .In this case ,the lack of significance in the observed differences can be explained by the high coefficient of variation (CV) of this characteristic here associated to the individual variability observed among animals .

Conclusion The use of concentrated supplements with protein level below 32% of CP did not increase the urea excretion in grazing nursing calves in Brazilian autumn conditions .

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