

Effect of Cutting Time and Maceration on Nitrogen Utilization of Trefoil-Grass Hay by Growing Cattle.

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Feeding forage cut at sundown (PM) has been shown to improve N utilization by dairy cows. However, nutritional value of PM forage may be compromised due to rainfall, prolonged wilting time, leaching, and respiration. Maceration can enhance field drying and reduce wilting time. A birdsfoot trefoil-grass field was divided in four. Half was cut at 18:00 (PM) with 50% of the PM herbage macerated after 12 h (PMM) and left to wilt. The other half was cut at 06:00 (AM) the next morning with 50% of the AM herbage macerated after 4 h (AMM) and left to wilt. The 4 hays were field dried, baled at the same time, and chopped prior to feeding. Four growing steers were used in a 4 x 4 Latin square with a 2 x 2 factorial arrangement of treatments to investigate the effects of forage cutting time (CT) and maceration (MAC) on N balance. Total collection of urine and feces were done for 6 consecutive days at the end of each 21-d period. Concentration (% DM) of CP averaged 11.6 (PM), 11.2 (AM), 10.2 (PMM), and 10.2 (AMM), while that of water soluble carbohydrates averaged 9.0 (PM), 7.0 (AM), 9.5 (PMM), and 8.1 (AMM). Intake of N was lowest in the macerated hays. Fecal N excretion (% of N intake) was greater ($P = 0.04$) in macerated vs. non macerated hays. Steers fed PM-cut hays had reduced (% of N intake) excretions of urinary N ($P = 0.08$) and enhanced retained N ($P = 0.03$). Significant CT x MAC interaction was observed for retained N (% of N intake) showing that non macerated PM-cut hay had the greatest N retention.

Effect of cutting time and maceration on N intake (g/d) and N balance (% of N intake).

Item	Treatments				SED	<i>P</i>		
	PM	AM	PMM	AMM		CT	MAC	CT x MAC
N intake, g/d	129	112	106	108	4.93	0.08	<0.01	0.04
Fecal excretion	40	43	46	44	1.77	0.63	0.04	0.08
Urinary Excretion	32	37	33	35	2.66	0.08	0.70	0.47
Retained N	28	19	22	21	2.32	0.03	0.24	0.05

Implications: For lactating dairy cows, a greater N retention is correlated with increases in either milk production and liveweight gain suggesting that high producing cows fed high TNC forages would produce more and/or be in better condition.