Animal performance and feed conversion with corn silage harvested at different maturity stages

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Introduction The strategic use of high quality silage in cattle's feed reflects in significant increase in meat production and reduces feed costs. In this sense it was aimed to evaluate the effect of maize silage harvested at different maturity stages on performance and feed conversion in beef cattle feedlot.

Material and Methods The experiment was conducted at the Instituto Federal de Educação, Ciência e Tecnologia do Sul de Minas Gerais - Campus Muzambinho in the city of Muzambinho – MG, during the months from August to December, 2009. The experimental design was randomized blocks (DBC) in a 2 x 4 factorial scheme, with eight repetitions, two commercial hybrids and four stages of physiological maturity hybrids: Without Milk Line (WML), 1/3 of Milk Line (1/3 ML), 1/2 of Milk Line (1/2 ML) and 2/3 of Milk Line (2/3 ML), totalizing eight treatments and 64 experimental units (constituted by an animal, Nelore uncastrated bull, with an average age of 18 months and average weight of 354.59 kg). To determination of the average daily gain (ADG), the final weight was subtracted from the initial weight and divided by the number of days used for feedlot evaluation. The feed conversion was calculated as dry matter intake (DMI)/ADG. Statistical analyzes were performed using the statistical software SISVAR and the averages were compared by Scott-Knott (5%) test.

Results and Discussion It was found that there was change in ADG ($P<0.05$) with the advancement of maturity stage, without effect of hybrids (Table 1). The greatest performances were for the maturity stages 1/2 ML and 2/3 ML. There was interaction between maturity stage and ADG, whereas ADG was positively correlated with increasing grain maturity.
Hypotheses to explain the higher performance in higher stages of maturation would be due to the higher levels of CNF, DM digestibility and higher DMI. In this sense the highest DMI may result in a higher intake of nutrients accumulated in the plant during physiological maturity, as previously discussed.

There was no interaction between maturity stage x hybrid for feed conversion, not significantly different between treatments (Table 2). However, for stages of maturation significant differences were observed ($P<0.05$), on the average of feed conversion of cattle. The stages of maturation of 1/3ML and 1/2ML had the lowest feed conversion.

The economic viability of corn silage is directly related to accumulation of production of dry matter and the nutritional value that ensures adequate fermentation process, better preserving the nutrients that will be available to animals for the best animal performance. In this sense the maturity stage defines the proportion cost/benefit of silage's production.

Conclusions Maturity stages for corn harvested for silage influence on the performance of cattle. The crop of the maize plant in advanced stages of maturation, with 1/2 milk line and 2/3 milk line on the seed is a viable option for the production of silage.

Table 1 Performance of animals fed diets containing corn silage with different maturity stages

	Stages of maturation				
Hybrids	**WML**	**1/3ML**	**1/2ML**	**2/3ML**	**Average**
	Average Daily Gain				
AG 4051	1.121Ac	1.228Ab	1.415Aa	1.325Aa	1.272A
P 30F90	0.992Bc	1.190Ab	1.345Aa	1.365Aa	1.223A
Average	1.056c	1.209b	1.380[a]	1.345a	
CV(%) = 8.05					

CV: Coefficient of variation, ML: Milk Line, WML: Without Milk Line.
Averages followed by the same lowercase and uppercase letter in the column and row do not differ by Scott Knott's test (P<0.05).

Table 2 Average and coefficient of variation for treatments

	Stages of Maturation				
Hybrids	**WML**	**1/3ML**	**1/2ML**	**2/3ML**	**Averages**
	Feed Conversion				
AG 4051	8.17Aa	7.55Aa	7.57Aa	8.86Aa	8.04A
P 30F90	9.27Aa	8.47Aa	8.00Aa	8.57Aa	8.58A
Averages	8.72b	8.01a	7.79a	8.72b	
CV(%) = 13.39					

CV: Coefficient of variation, ML: Milk Line, WML: Without Milk Line.
Averages followed by the same lowercase and uppercase letter in the column and row do not differ by Scott Knott's test (P<0.05).