



# CHEMICAL COMPOSITION OF MASSAI GRASS (*Panicum maximum* CV MASSAI) ENSILED WITH SUNFLOWER CAKE FROM BIODIESEL INDUSTRY.



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## INTRODUCTION

The ideal time to cut tropical grasses for ensiling is the same time when they present low dry matter content and, thus, provide inadequate fermentation and promote the loss of nutrients (McDonald, 1981). However, the reduction in humidity can be done through the use of absorbent additives (Ribeiro et al, 2008).

The sunflower cake is produced by the biodiesel industry as a by-product and it has potential as a ruminant feedstuff.

The objective of this study was to evaluate the chemical composition of massai grass silage with inclusion of different levels of sunflower cake.



Figure 1: Sunflower



Figure 2: Sunflower cake

## MATERIAL AND METHODS

The experiment was carried out at the Veterinary Medicine School of the Federal University of Bahia, Salvador, Bahia state, Brazil.

The treatments were constituted of massai grass and levels of sunflower cake. Sixteen samples were ensiled in 15 L plastic buckets with the different concentrations of sunflower cake.

Analyzes were done to measure dry matter, crude protein, ash, neutral detergent fiber, acid detergent fiber, ether extract, non-fiber carbohydrates, hemicellulose, cellulose and lignin, as described by Silva & Queiroz (2002).

Table 1. Chemical composition of ingredients of silage

Nutrients	Ingredients	
	Massai grass	Sunflower cake
Dry matter	21.28	93.28
Crude protein	7.40	27.38
Ash	10.28	5.48
Ether extract	0.68	6.74
Neutral detergent fiber	67.71	42.36
Acid detergent fiber	48.62	26.94
Lignin	10.43	6.85
Cellulose	38.19	8.57
Hemicellulose	19.08	15.42
Non-fiber carbohydrates	15.93	18.04

## RESULTS AND DISCUSSION

The chemical analysis showed a linear increase ( $Y=23,2 + 0.85x$ ) in the silage dry matter, crude protein ( $Y=7.6 + 0.44x$ ), and ether extract ( $Y=2,1 + 0,1x$ ). The non-fiber carbohydrates also had a linear increase ( $Y=13.3 + 0.21x$ ) with increasing concentrations of sunflower cake in the massai grass silage. However, the concentration of mineral, ADF, NDF, cellulose, lignin, and hemicellulose decreased linearly with addition of sunflower cake, with their respective regression equations:  $y=12.4 - 0.22x$ ,  $Y=64.46 - 0.53x$ ,  $Y=44.75 - 0.4x$ ,  $Y=13.06 - 0.17x$ ,  $Y= 31.6 - 0.23x$ , and  $Y= 19.7 - 0.13x$ .

## CONCLUSION

The addition of sunflower cake to massai grass silage improved the nutritive value of the silage, with better results with 24% of inclusion. However, the use of grass ensiled with sunflower cake for ruminant nutrition may be dependent on the evaluation cost of the production system and animal performance.