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TECHNICAL NOTE
Effect of Ammonified Taiwan Grass (*Pennisetum* sp.) Combined with Procreatin 7 Yeast on Growing and Fattening West Africa Ovines

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INTRODUCTION

Ovine and Caprine production systems in Venezuela are usually located in arid and semi-arid areas. They are sources of income and a means of sustenance for a vast sector of the population. However, they are unattended and marginalized, despite the production potential and the social and economic impact of breeding and development (Contreras, 2009).

In the dry season, herd nutrition is compromised, because the graminaceae species age or stop growing, dropping nutritional quality. As a result, an increase was observed in the number of animal losses caused by rejection.

In that sense, Urbano *et al.* (2008), noted that the main obstacles to pasture production are seasonability, inappropriate grazing management, absence of fertilization plans, depending on the species requirements and the soil, and poor use of improved grass seeds.

Among grass species, Pennisetum shows high yields and acceptable quality when proper agro-techniques are applied (Martínez, 2001). That way, forage deficit could be reduced in ruminant meat-production systems during the dry season.

There are several methods to improve the quality and good use of forage resources, like urea ammonification. It is a simple process that can be handmade with low costs and little environmental risk (Mancilla, 2011). During the process, fiber is solubilized with protein content increase, which has an effect on pasture digestibility that improves consumption by the animal (Guédez, 2007).

Other nutritional improvement processes that include yeasts have also been described. Yeasts improve ruminal environment, increase concentration and activity of bacteria that degrade cellulose, hemicellulose, and the bacteria that use lactic acid, improving feed digestion (Dawson, 1987 and Williams, 1989).

The above grounds prove the relevance of ammonified forage with yeast products, like Procreatin 7, to feed growing-fattening ovines, in order to assess their behavior in terms of daily and total gains.

DEVELOPMENT

The experiment lasted 120 days, and it was made on *La Muñeca Farm*, on carretera vía Baronero, Timi-Timi sector, Antolín Tovar Parrish, San Genaro de Boconito Municipality, Portuguesa State, Bolivarian Republic of Venezuela.

For ammonification, 10-month old Taiwan grass (*Pennisetum* sp.) was collected (lignified grass). Then it was chopped and urea was added (4% urea), and was placed in plastic bags for 21 days (preparation 500 kg). The yeast was added at the time of mixing the forage with urea.

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The treatments were based on,

- Treatment 1 Ammonified Pennisetum grass.
- Treatment 2 Ammonified Pennisetum grass, plus 150 g of Procreatin 7.
- Treatment 3 Ammonified Pennisetum grass, plus 250 g of Procreatin 7.

Six West Africa rams, live weight 13.7 ± 0.2 kg, were used. All were adapted to handling and indoor housing for ten days, in separate cages with troughs for water and feeds. Each animal received antiparasitic treatment (Ivomec) before the experimental period. The bromatological composition percent of feeds are shown in Table 1.

Experimental design and statistical analysis: a completely random design, with 2 replicas per treatment was used. Statistical analysis included single factor variance analysis. The Duncan (1995) multiple range test was made for mean comparison. The data were analyzed by Statistica, version 8.0 (Statsoft, 2009).

Although no significant differences were observed in the three treatments for DM, CP, and CF (Fig. 1; 2; and 3) in all the cases consumption was higher than the treatments using Procreatin 7, at a rate of 150 and 250 g of ammonified forage with 4% urea.

Ammonification is known to improve the nutritional quality of forage (De Bartolo, 2013). He did not observe statistical significance in consumption; however, the values achieved are high for ammonified forages, which meant a acceptance by the ovines assessed.

Birbe *et al.* (1996) noted that the materials treated with urea can meet the requirements for microorganisms in the rumen, with increased fermentation of fiber materials and high production of microbial protein and volatile fatty acids, with ensuing voluntary consumption increase.

Botero (2007) reported that ammonification allows to preserve high energy starch and sugars in their original form in the grass, avoinding loss through fermentation.

Escobar and Parra (1983) noted that animal production (ovines and bovines) increases when the animals are fed with urea-treated residues. Moreover, Preston and Leng (1989) pointed out that ammonification causes death and regeneration of ruminal flora, which is used as by-pass protein, that increases dry matter consumption from the material.

Procreatin 7 could have led to it, because, according to Botero (2007), the microorganism (Saccharomyces cereviseae) has the capacity to consume oxygen in the rumen, which is toxic to benefic bacteria, and to encourage microbial populations growth.

Likewise, this product stabilizes the pH in the rumen and promotes growth of bacteria that consume lactate (*Selenomonas ruminantium*), that reduce ruminal acidosis. Furthermore, it stimulates volatile fatty acids (VFA) that promote rumen microorganisms growth, and increases feed degradation and production of volatile fatty acids (propionic, lactic, and butyric), which account for two third parts of the energy the ruminant animal will have.

The effect of treatments in PVF, GPT and GMD, had a significant influence ($P < 0.001$). The arguments presented in the discussion of the previous indicators have a close relationship with that behavior, considering that the ammonified forage treatments and the increasing addition of Procreatin 7, produced the greatest GPT and GMD (Figs 4; 5; and 6).

The results were higher than the reports by DeBartolo (2013), who used three varieties of ammonified forages, and reached GMD below 100g; and reports by Guédez (2007), who achieved gains between 15 and 30 g/day.

Weight gains with the inclusion of Procreatin 7 may be considered within the limits desired for growing-fattening rams, which may also be associated to the greater protein content provided to the treatments.

CONCLUSIONS

The results achieved with the combination of forage ammonification and the addition of Procreatin 7, a yeast, are better than reports from most ovine production systems in Venezuela, which, according to Baldizán (2000), are extensive, poorly productive, and rely on native grass for nutrition, with weight gains that barely reach 50g/animal/day.

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Table 1. Bromatological composition (%) of feeds

Indicators	Treatments		
	1	2	3

	Ammonified forage at 4% with urea	Ammonified forage at 4% with urea + 150 g Procreatin 7	Ammonified forage at 4% with urea + 250 g Procreatin 7
Moisture	49.1	49.6	49.08
DM	50.9	50.4	50.92
Ashes	14. 1 ,1	13.89	13.79
Ethereal extract	1.71	1.49	1.12
CP	7.72	7.94	8.41
Total nitrogen	1.32	1.26	1.25
CF	41.31	41.57	41.61
NFE	35.68	38.37	40.42
NDF	70.25	70.73	71.65
ADF	54.6	55.15	56.28

DM: dry matter; PC crude protein; FC crude fiber; NFE: nitrogen-free extract; NDF: neutral detergent fiber; ADF; acid detergent fiber

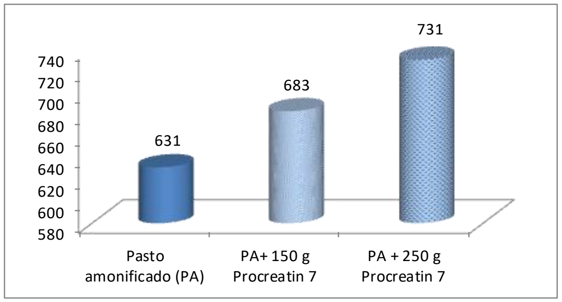

Figure 1 DM consumption (g/animal/d) during the experimental period

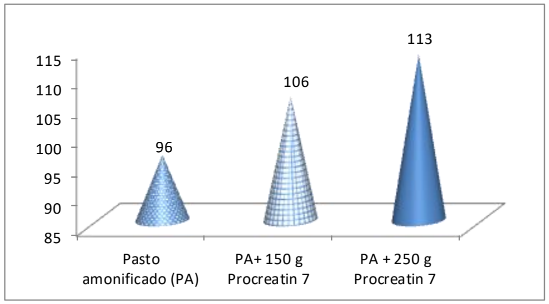

Figure 2. CP consumption (g/animal/day) during the experimental period)

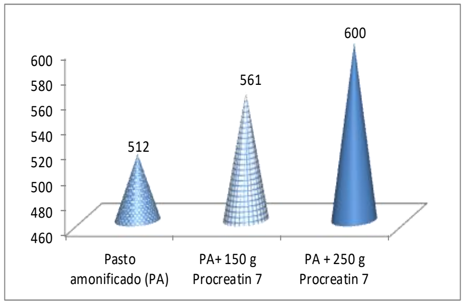

Figure 3. CF consumption (g/animal(d) during the experimental period Figura 3.

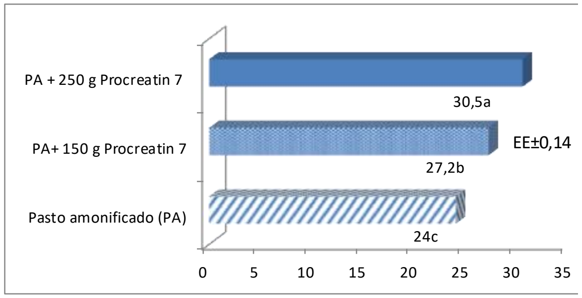

Figure 4. Effect of treatment on PVF

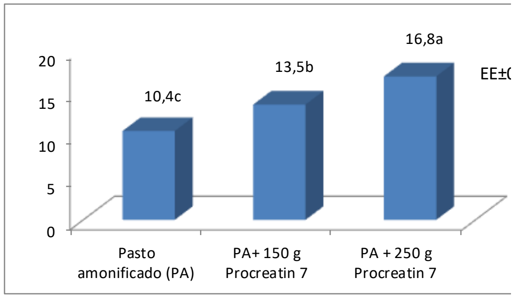

Figure 5. Effect of treatment of GPT

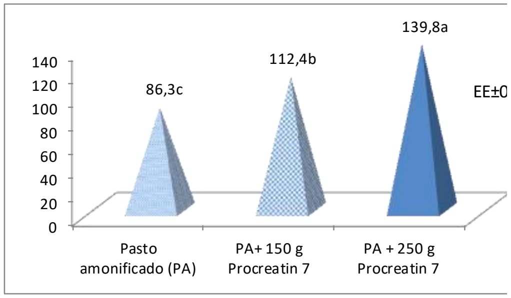

Figure 6. Effect of treatment on GMD