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Introduction

Buffaloes are animals recognized for their high utilization of fibrous foods such as high and low quality forages. Few researches involve the knowledge of the real functioning of the ruminal metabolism together with the behavior of the structures of the ruminal wall of buffaloes before different production systems.

Objective

This study evaluated the digestibility and ruminal morphophysiology of water buffaloes finished in feedlot and receiving concentrate diet ad libitum (corn silage, ground corn, cottonseed meal, urea, calcitic limestone, and premix).

Material and Methods

Seventy-eight male water buffaloes of different genetic groups (GG; Jafarabadi, Mediterranean, and Murrah; n=26 animals for each GG; 378.57±42.76 kg of initial body weight - BW) were used. The digestibility evaluation was performed and the feces samples were collected after 84 days, for 13 consecutive days [10 days of data collection for dry matter intake (DMI) calculation, and three days of feces collection]. Samples of the ruminal epithelium were collected for morphological and histological analysis of the ruminal papillae postmortem.

Results

Table 1. Means and probabilities of performance variables and digestibility, histological and morphological variables of the ruminal papillae of water buffaloes of different genetic groups finished in feedlot.

Variables	Genetic Groups			SEM	P-value
	Jafarabadi	Mediterranean	Murrah		
Performance					
IBW ¹ , kg	433.08 ^a	347.56 ^B	355.06 ^B	14.75	<0.01
FBW ² , kg	562.81 ^A	482.19 ^B	463.75 ^B	17.37	<0.01
ADG ³ , kg/d	1.57 ^A	1.60 ^A	1.29 ^B	0.07	<0.01
DMI ⁴ , kg/d	10.72 ^A	10.17 ^A	9.03 ^B	0.44	<0.01
DMI, % BW	2.14 ^B	2.47 ^A	2.21 ^B	0.07	<0.01
Digestibility, %DM	68.50	66.97	69.28	1.20	0.15
Histological					
Papillae area, mm ²	0.922	0.933	0.917	0.06	0.97
Papillae width, mm	0.338 ^A	0.303 ^B	0.316 ^{AB}	16.15	0.09
Epithelium, µm	49.14 ^B	48.99 ^B	55.46 ^A	4.97	<0.01
Keratin, µm	10.69	9.83	10.37	0.48	0.20
Morphological					
ANP ⁵	56.48 ^B	66.31 ^A	58.04 ^B	13.88	0.09
APA ⁶ , cm ²	0.23	0.19	0.22	0.03	0.27
ASA ⁷ , cm ²	13.38	12.59	13.78	1.51	0.73
RSPA ⁸ , %	92.76	91.99	92.64	0.80	0.58

1 = Initial body weight ; 2 = Final body weight; 3 = average daily gain; 4 = dry matter intake; 5 = average number of papillae; 6 = average papillae area; 7 = ruminal epithelium absorption surface area; 8 = representativeness of the papillae on the absorptive surface.

Highlights

- ✓ There was no effect of the GG for digestibility ($P = 0.15$);
- ✓ Jafarabadi and Mediterranean showed superior feedlot performance compared to Murrah ($P < 0.01$) for average daily gain;
- ✓ Mediterranean presented higher values for DMI than the other GG;
- ✓ Murrah obtained higher value than other GG for the variable epithelium ($P < 0.01$)

Conclusions

In conclusion, GG of water buffaloes have some differences in feedlot performance and ruminal traits, however, these characteristics do not affect digestibility.

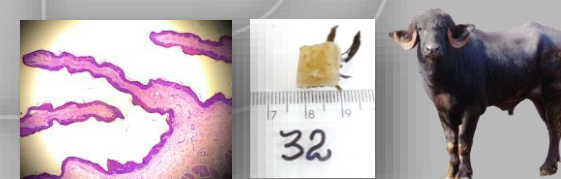


Figure 1. Histological and morphological section, respectively, of the ruminal papillae of water buffaloes.

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