

CECAL CONTENT COMPOSITION AND DRY MATTER EXCRETION IN RABBITS CONSUMING SUGAR CANE MEALS

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ABSTRACT

Twenty-Four white Semigiant x New Zealand commercial hybrid male rabbits of 4.5 months of age and 2.4 kg average weight were used in a completely randomized design. The objective was to study the effect of sugarcane meal (SM) on the cecal contents composition and dry matter (DM) excretion of rabbits. The animals were distributed in four treatments with 0, 15, 30 and 45 % SM inclusion in the diets. Six animals per treatment were used. They were allocated in individual metabolism cages and offered 120g of feed/day. The animals were slaughtered at 14 days age and the contents of their digestive organs, were weighted and DM, crude protein (CP) and acid detergent fiber (ADF) were determined and expressed as percentages of the live weight(LW). Significant ($P<0.01$ and $P<0.05$) differences were observed in the contents in g/kg DM and the percent the live-weight for the DM respectively in the diets with 30 and 45 % SM. With the increase of the SM decrease DM contents in feces ($P<0.05$) and ($P<0.05$) for the 30 and 45 % SM level with values of (22.17 and 17.57g/kg DM and 0.96 and 0.63 % LW. It is concluded that the inclusion of more than 15 % of sugar cane meal in rabbit diets had negative effect on the dry matter cecal contents and the excretion of dry matter in the feces due to the characteristics of the sugar cane fiber.

Key words: rabbits, cecal contents, sugarcane meal.

INTRODUCTION

The rabbit is an animal that eats a great number of feeds mainly those with high contents of fiber. The fiber is digested with a lower efficiency compared to other species such as horses. The search for new feeds and their combinations can stabilize the microbiological caecal activity and the passage of the digesta through the gastrointestinal tract, this has permitted to include non traditional feed sources for alfalfa substitutions .

The sugarcane meal and its by products are one of the alternatives for inclusion on the diets (PÉREZ 1990) Chemical – physical characteristics can regulate the rate of passage and excretion of nutrients in the feces of the rabbits (DIHIGO 2001).

This paper presents the results of the effect of inclusion of various levels of sugarcane meal on the caecal composition and excretion of dry matter in rabbits.

MATERIALS AND METHODS.

Diets. Different percentages of SM inclusion were evaluated in four treatments. The SM was produced from fresh ground and sun-dried sugarcane. After 48 h drying the product was ground in a hammer mill, sieved at 1mm and included in non-pelletized diets, prepared according to the rabbit requirements (LEBAS 1980) table 1 composition of the SM and the alfalfa meal.

Table 1. Composition of the SM and Alfalfa (%)

Chemical composition	Sugarcane meal	Alfalfa meal
Dry matter	90.00	85.40
Crude protein	02.40	15.20
Crude fibre	26.00	20.00
Neutral detergent fibre	59.61	43.50
Acid detergent fibre	34.60	31.10
lignin	06.86	7.70

Animals. Twenty-four White Semigiant x New Zealand commercial hybrid male rabbits of 4.5 months of age and 2.4 kg average weight were used. The animals were allocated in individual metabolism cages. They were distributed in a completely randomized design in four groups with six replications and 12h periods of light and darkness. Feeding was restricted to 120 g per animal as meal throughout the 14 day experimental period. After the experimental period the animals were injected local anesthesia via the cervix and slaughtered.

The contents of the gastrointestinal tract and the production of feces were weighted and stored at -20°C . The chemical analysis of diets were conducted according to GOERING and VAN SOEST (1970) for ADF. The methods of the AOAC (1990) were used to determine DM and crude protein (CP) in the cecal contents and feces. They were expressed as g/kg DM and liver weight percentage (LW).

The analysis of variance was carried out according to the SPSS system for Windows . DUNCAN'S (1955) multiple range test was applied when necessary.

RESULTS AND DISCUSSION

Table 2 shows the digestive contents of different segments of the gastrointestinal tract, cecal nutrients contents and excretion of DM. Non- significant differences were found in the percentage of the digestive contents in relation to the LW of the organ of the

gastrointestinal tract and in cecal contents of acid detergent fiber (ADF) and crude protein (CP).

Table 2. Digestive contents in different segments of the gastrointestinal tract in (% LW) nutritive contents in caecum and the feces (g/kg and % the LW).

	% of inclusion of sugar cane meal				ES±Sig
	0	15	30	45	
Digestive Contents ,(%LW)					
Tract Contents	10.19	9.19	8.19	8.35	0.84
Stomach	4.01	3.54	3.68	3.36	0.54
Small Intestine	0.53	0.54	0.45	0.76	0.17
Caecum	4.61	3.95	3.49	3.63	0.29
Nutritive contents in the caecum					
Dry Matter, (g/Kg MS)	31.74 ^a	26.83 ^{ab}	21.57 ^b	23.49 ^b	1.94 ^{**}
% LW	1.28 ^a	1.04 ^{ab}	0.90 ^b	0.98 ^b	0.09 [*]
Crude Protein ,(g/kg MS.)	12.8	13.63	10.14	10.55	0.99
% LW	0.48	0.53	0.43	0.44	0.04
Acid detergent fiber (g/kgMS.)	8.57	6.57	5.9	5.92	1.3
% LW	0.32	0.25	0.24	0.24	0.03
Fecal Dry Matter (g/kg. MS)	36.99 ^a	35.15 ^{ab}	22.17 ^{bc}	17.57 ^c	4.54 [*]
% LW	1.39 ^a	1.39 ^a	0.96 ^{ab}	0.63 ^b	0.20 [*]

^{ab}Rows with different letters differ significantly at P<0.05 according to Duncan(1955)*P<0.05 **P<0.01

A decrease of DM g/kg(P<0.01) and DM contents LW percentage (P<0.005) was observed for the 30 and 45 % SM level of inclusion respectively; compared to the control and 15 % level.

That difference could be due to a higher practice of cecotrophy for the animal that eats insoluble fiber (GIDENNE et al 1996). Those types of fiber permit to control the rate of passage in the caecum for the high percentages of large particles in the SM and their volume. This makes a percentages of particles go directly to the colon to be part of the hard feces and the other part stimulating the emptying of the cecum to form cecotrophics (CARABAÑO, 1998). The use of sources of fiber such as SM stimulates the production of the total bacteria in the caecum (RODRÍGUEZ (2001) in pigs. On the other hand, that action stimulating of the SM the supply of the necessary substrate for microbial growth and production of volatile fatty acids (VFA) and ammonia. Due to these characteristics, there are attributed the SM regulation of the rate of passages in the gastrointestinal tract. (DIHIGO, 2001). The values of DM content are within the ranges expressed in the literature (CARABAÑO, 1988) in diets with different levels of fiber.

One less (P<0.05) and (P<0.05) in the excretion of DM and the percentage of the liver-weight respectively for the treatments with 30 and 45 % SM with respect at 0 and 15 % was observed. These determinate the high capacity the fiber to retain water, that contributed less content of DM in the feces (GIDENNNE,1992).

It is concluded that the inclusion of more than 15% of sugar cane meal in rabbit rations have negative effects on the dry matter caecal contents and the excretion of dry matter in the feces due to the characteristics of the sugar cane fibre.

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