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PROGRAMA DE PÓS-GRADUAÇÃO EM ZOOTECNIA

DIGESTIBILITY AND RUMINAL PARAMETERS OF DIETBASED IN ROUGHAGE WITH THE ADDITION OF PROPOLIS (LLOS*) AND MONENSIN SODIUM FOR STEERS[4]

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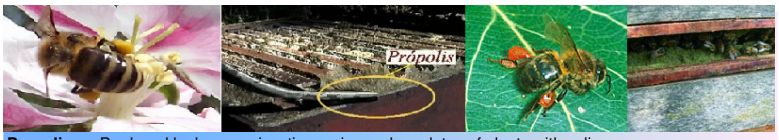
INTRODUTION



Propolis => Produced by bees => junction resins and exudates of plants with salivary enzymes

Quality of propolis and its constituents are determined by the environment and the bee flora existing around the apiary.

Action: antimicrobial, antioxidant, anti-tumor, wound healing, tissue repair, against, intestinal parasites and blood, antimutagenic

Alcoholic => extract substances that vary in their polarity

Each alcohol extraction and concentration of propolis results in differents extrats with differents active substances → HPLC - quality control

Propolis has been tested in ruminant feed and showing signs that **can be an alternative to ionophores**

Use of ionophores in the diet of ruminants → improve the parameters of digestion and rumen fermentation →increased energy available to the animal and reduce the production of methane gas.

Monensin → use prohibited in the European Union (Regulation - EC, 2003).

Objective: To study the effect of administration of products based on propolis powder LLOS (PI No. 0605768-3) in two concentrations of propolis (B and C) and two alcohol extractions (1 and 3) and monensin on intake and total digestibility in cattle fed diets based on roughage.

MATERIALS AND METHODS

Location: UEM - Maringá / PR

Animals: 4 Holstein cattle, bulls with PV = 221 ± 21 kg, patients with cannulas in the rumen.

Roughage: concentrate → 72,5:27,5

Provision of food: limited to 2.5% PV

14,4 % PB e 67% NDT

Experimental diets:

→ **Control diet** (55.25% corn silage + 17.25% Tifton hay + 9.7% soybean meal + corn 15.3% + 1.0% urea + 0.5% soy oil + 1 , 0% mineral + 9% soybean meal + 1% mineral salt)

→ **Monensin diet**: control diet + 2 g ionophore (10% monensin - Rumensin ®) / day

→ **LLOSC1 Diet** (PI No. 0605768-3): control diet + 2 g of propolis dry LLOSC1 (concentration of propolis C, alcoholic 1) / day.

→ **LLOSB3 Diet** (PI No. 0605768-3): control diet + 2 g of propolis dry LLOSB3 (B concentration of propolis, alcohol content 3) / day.

Periods: 4 Period of 21 days / each (14 d adaptation and 7 d of collection).

Collection: 100 g of feces directly into the rectum, 50 mL of rumen fluid for analysis of pH and NH3-N at 0, 2, 4, 6, 8 h after the first feeding.

Indicator: Chromic oxide (Cr2O3) - 10 g per day intra-ruminal

Laboratory: DM, OM, CP and EE → methodologies cited in Silva & Queiroz (2002), the NDF and ADF → according to Van Soest et al. (1991). N-NH3 □ according to the technique of Ferner (1965) modified by Vieira (1980).

Experimental design: Latin square 4 x 4

Analysis of variance: SAS - PROC GLM - Test medium: a 5% level of probability **For values of pH, NH3-N →** there subdivision of plots depending on sampling time. We used a regression analysis for concentrations of pH, NH3-N as a function of time after the morning feeding (0, 2, 4, 6, 8 hours) for each diet and the effect of time was split into orthogonal polynomial

RESULTS AND DISCUTION

Total digestibility of DM and Nutrients

Lower digestibility with the addition of monensin and products based on propolis compared to control → probable action on Gram positive bacteria - fermenting cellulose and protease → selection and / or decrease in the number of them and thus caused the decrease in TD NDF (51% dietary NDF) and therefore the TD DM and other nutrients.

Products based on propolis vs monensin → worse results observed in the TD of DM, OM, CP and EE. However, good results on the IVDMD was observed for the products LLOSC1 and LLOSB3 for monensin and control, which did not differ in diets based on forage (Prado, 2005): therefore **review the dosage used in cattle.**

Propolis → select different types of bacteria depending of product used and of diet used → **LLOSC1 in roughage diet** → select general bacteria (degrades different substrates) → **LLOSB3 in roughage diet** → select bacteria specialists (prefer a more specific substrate; Prado, 2008)

Propolis → Decrease in population of protozoa (Broudiscou et al. 2000).

Mode of action → inhibition of bacterial RNA polymerase (Takaisi-Kikuno & Schilcher, 1994).

Table 1 - Mean, probability (P) and coefficient of variation (CV) for DM intake (kg per day), apparent digestibility, pH and rumen ammonia nitrogen (mg/100 ml) in cattle fed diets based forage and different additives based on propolis LLOS1 and monensin.

	Diets					
	Control	Monensin	LLOSC1	LLOSB3	P	CV
DM Intake (kg/ dia)	6,42	6,10	6,29	6,28	0,3036	3,431
Total Digestibility						
DM (%)	63,2a	58,7b	56,4c	54,3d	0,0001	1,2898
OM (%)	64,2a	59,7b	57,6c	55,0d	0,0001	1,3231
CP (%)	65,4a	63,1b	59,7c	56,5d	0,0001	1,4953
EE (%)	82,0a	80,1a	75,3b	65,2c	0,0001	2,3190
NDF (%)	55,5a	49,3b	47,9b	45,5b	0,0017	3,8986
ADF (%)	54,8a	46,1b	44,8bc	40,1c	0,0003	4,2265
Ruminal parameters						
pH	6,37ab	6,43a	6,24ab	6,18b	0,0145	4,06
N-NH_3(mg/100mL)	10,32	9,44	11,29	11,54	0,8470	43,95

Means in the same row followed by same letters do not differ statistically by Tukey test at 5%. 1 LLOS: products based on propolis extracted with alcohol at different levels (1 and 3) and different concentrations of propolis (B and C), LLOSC1 and LLOSB3

CONCLUSIONS

The use of monensin and products based on propolis have not been effective in diets based on forage for cattle growing.

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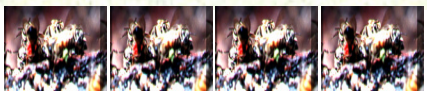

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