

# State University of Maringá

## Department of Animal Science



# Adding Products to the Base of Propolis (LLOS\*) in Diets for Dairy Cows: Milk Composition and Blood Parameters

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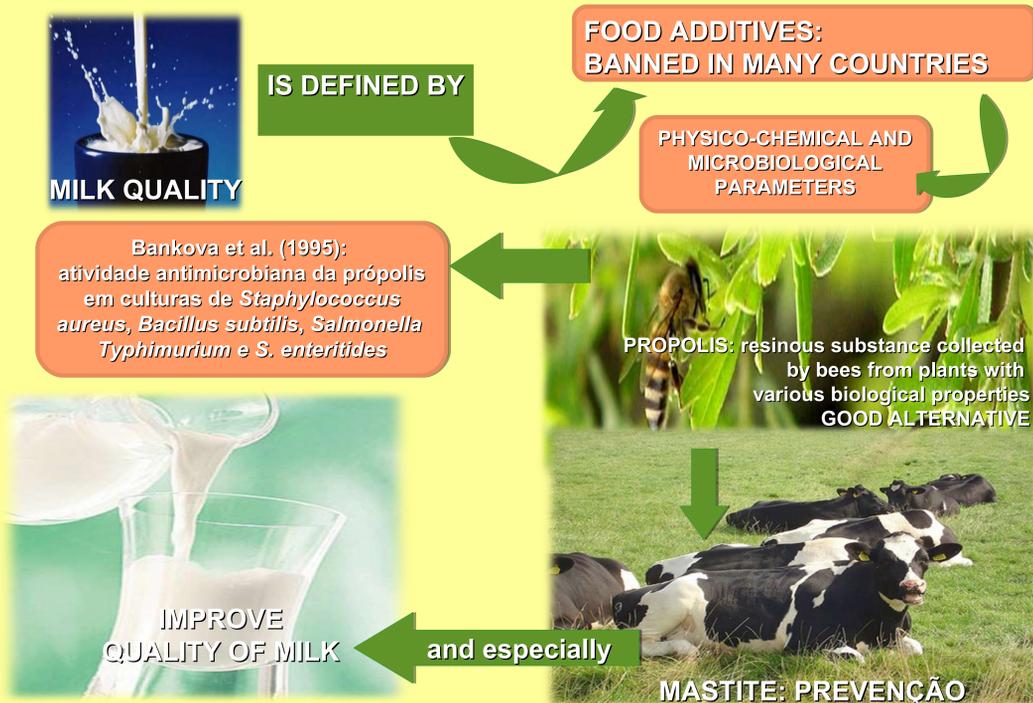
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## INTRODUCTION



**OBJECTIVE:** To evaluate the effect of propolis-based products that differ in the concentration of propolis, alcohol content, and concentration of flavonoids (LLOS\*) on the characteristics that determine the quality of milk and on blood parameters of dairy cows.

## MATERIALS AND METHODS

**LOCATION:** Iguatemi Experimental Farm (FEI), located in Maringá, PR.

**ANIMAIS:** Four Holstein cows, cannulated in the rumen, with 550 kg of body weight and 147 d of lactation were subjected to 2 daily milkings (0600 and 1500h) and randomly assigned to a 4 × 4 Latin Square.

**EXPERIMENTAL DIETS:** 60.27% corn silage and 39.73% concentrate (corn, soybean meal, wheat bran, soybean oil, limestone, ammonium sulfate, vitamin and mineral supplement), containing 17.3% CP, 1.61 Mcal/kg of NEL differing on the addition or not of the PBP, where:

CONTROL  
(without PBP)

LLOB3++  
(0,033 mg/g of flavonoids chrysin in total)

LLOC3++  
(0,054 mg/g of flavonoids chrysin in total)

LLOC1++  
(0,090 mg/g of flavonoids chrysin in total)

**PRODUCT SUPPLY LLOS:** products based on propolis were placed inside the rumen via ruminal cannula at the time of delivery of feed (08 h and 16 h).



**PHYSICAL AND CHEMICAL COMPOSITION OF MILK:** Milk Acidity: Dornic method. Density: termolactodensímetro de Quevenne. Chemical analysis of milk: the samples were placed in plastic bottles containing preservative Bromopol, which were sent to the Laboratory Program Dairy Herd Analysis of Paraná (PARLPR), which were analyzed for fat, protein, lactose and total solids by the 2000 Bentley® infrared analyzer. CCS: electronic counter Somacount 500®. N-urea concentration in milk: colorimetric method.

**BLOOD PARAMETERS:** blood samples were taken on day 21 of each experimental period, by puncturing the jugular vein 4 hours after the first daily meal delivery. The samples were collected to measure total cholesterol, glucose and urea-N.

**STATISTICAL ANALYSIS:** Why not follow a normal distribution, the SCC values were transformed into logarithms (log) in base 10. The variables were analyzed using the MIXED procedure (SAS, 2000) and differences between treatment means were determined by Tukey's test considering the 5% level of significance.

## RESULTS AND DISCUSSION

The addition of products based on propolis (LLOSA) did not affect production and milk composition, and blood parameters (Table 1) of dairy cows. However, there is the product based on propolis LLOB3++ (with a lower concentration of total flavonoids) reduced by 29% and 16.8% the number of CCS (x 10<sup>3</sup>/mL) and blood concentrations of total cholesterol in relation to diet control, respectively. Regarding the composition of milk, there is an inversion in fat and protein. This reversal may be due to the addition of soybean oil in the diet of cows. Unsaturated fatty acids in the diet were probably biohidrogenados rumen trans fatty acids (cis 9, trans 11-18:2, trans 11-18:1), causing depression in the synthesis of short chain fatty acids by the mammary gland, with consequent reduction in the percentage of milk fat.

Table 1 - Production, milk composition and blood parameters of cows fed diets without the addition of products based on propolis (CON) or with the addition of products based on propolis (LLOC3++ , LLOC1++ and LLOB3++) and standard error (SE)

	Treatments				EP	P=
	CON	LLOC1++	LLOC3++	LLOB3++		
Milk production (kg/day)	16,11	16,50	16,35	17,23	1,60	0,96
Fat (%)	2,87	2,84	2,79	2,49	0,27	0,75
Protein (%)	3,75	3,61	3,62	3,76	0,37	0,98
Lactose (%)	4,39	4,45	4,35	4,40	0,09	0,91
Total solids (%)	11,99	11,91	11,69	11,69	0,54	0,96
Acidity °D	17,20	17,72	16,42	17,66	1,16	0,84
Density	1,03	1,03	1,03	1,03	0,00	0,84
CCS (x 10 <sup>3</sup> /mL)	204,62	164,81	193,25	145,93	110,8	0,98
CCS' (x 10 <sup>3</sup> /mL)	2,15	2,06	2,07	2,00	0,24	0,97
N-urea (mg/dL)	14,67	13,62	14,60	15,61	0,70	0,32
<b>Blood Parameters</b>						
Glucose (mg/dL)	65,00	70,50	66,00	69,50	3,43	0,63
Cholesterol (mg/dL)	total 144,50	155,00	141,00	120,25	19,13	0,64
N-urea (mg/dL)	17,99	17,87	19,04	19,98	0,83	0,35

## CONCLUSION

The addition of products based on propolis did not affect production and milk composition and blood parameters, however, was observed in 29% reduction in SCC in cows that received LLOB3++ compared to the control diet (145.93 vs 204.62 x 10<sup>3</sup>/mL), suggesting further studies.

## LITERATURA CITADA

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\* PI-0605768-3: Processo de obtenção do produto LLOS (à base de própolis), visando à substituição de ionóforos na nutrição de ruminantes