



ISOLATION AND EXPEDITIOUSLY CHARACTERIZATION MORPHOLOGY, BIOCHEMISTRY AND KINETICS OF RUMEN BACTERIA TOLERANT TO PROPOLIS - LLOS

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Table 2 Fermentation ability under different carbohydrate expressed in percentage of

bacteria strains tolerant to different product based on propolis - LLOS¹, obtained from animals fed on different diets

LLOS product	Roughage: concentrate	Effective (+) estimated	Effective (+) confidence interval	
			2.5%	97.5%
Cellulose				
LLOSC1	100:0	57.0	38.4	74.4
LLOB3	100:0	36.1	18.6	55.6
LLOSD1	50:50	52.3 ab	31.3	72.4
LLOSC3	50:50	63.1 a	41.1	82.5
LLOSC1	50:50	33.4 b	16.5	52.8
LLOSA2	50:50	70.0 a	39.8	92.5
Cellobiose				
LLOSC1	100:0	89.4	75.9	97.7
LLOB3	100:0	75.9	57.8	90.1
LLOSD1	50:50	52.4 b	31.8	72.8
LLOSC3	50:50	89.5 a	72.6	98.6
LLOSC1	50:50	74.9 ab	56.1	89.7
LLOSA2	50:50	79.8 ab	52.0	97.1
Arabinose				
LLOSC1	100:0	60.7	42.3	77.3
LLOB3	100:0	48.1	29.4	67.2
LLOSD1	50:50	61.7	40.6	80.9
LLOSC3	50:50	73.6	52.2	90.1
LLOSC1	50:50	45.9	26.9	65.5
LLOSA2	50:50	70.1	40.1	92.5
Xylose				
LLOSC1	100:0	64.2	46.1	80.4
LLOB3	100:0	48.0	29.4	67.2
LLOSD1	50:50	57.0	35.80	76.8
LLOSC3	50:50	68.3	46.3	86.7
LLOSC1	50:50	62.4	42.4	80.2
LLOSA2	50:50	60.1	29.6	86.2
Fructose				
LLOSC1	100:0	85.7	70.9	95.8
LLOB3	100:0	71.9	53.3	87.3
LLOSD1	50:50	57.3 b	36.1	76.9
LLOSC3	50:50	89.4 a	72.5	98.6
LLOSC1	50:50	83.4 a	66.7	95.0
LLOSA2	50:50	89.9 a	66.2	99.7
Lactose				
LLOSC1	100:0	96.4 Aa	87.1	99.9
LLOB3	100:0	80.0b	62.6	92.8
LLOSD1	50:50	90.5 ab	75.0	98.7
LLOSC3	50:50	94.7 a	81.5	99.8
LLOSC1	50:50	75.0 Bb	56.5	89.8
LLOSA2	50:50	80.0 ab	51.9	97.2

(+): visual growth in 48h; (-): no signs of growth until 48 hours of incubation; LLOS: product based on propolis extract under different alcoholic levels (1, 2, and 3) and different concentrations of propolis (A, B, C, and D); LLOSC1, LLOB3, LLOSD1, LLOSC3, and LLOSA2. Means in the column with different lowercase letters in the same diet differ statistically. Different uppercase letters in the column refer to contrast by LLOSC1 50:50 diet and LLOSC1 100:0 diet and differs statistically.

INTRODUCTION

Ruminant animals => symbiosis with microorganisms => degradation of cellulose

Need to improve feed efficiency => additives (ionophores banned since 2006)
decrease the production of methane
increase energy
decrease ruminal proteolysis
increase in true protein in the small intestine
decrease the ratio acetate: propionate,

Natural Additives

Propolis => produced by bees => junction resins, exudates of plants with salivary enzymes and waxes

Several actions => acts on bacteria, viruses, fungi, protozoa

Objective: Exploratory study the biochemical profile of strains isolated ruminal tolerant of products based on propolis LLOS.

MATERIALS AND METHODS

Local: Laboratory of Microbiology of the Rumen - EMBRAPA-JF
Laboratory Pharmaceutics-UEM (Franco & Bueno, 1999)
Experimental Campus Coronel Pacheco - EMBRAPA - JF

Products based on propolis LLOS (PI No. 0605768-3)

•100% roughage =>LLOSC1, LLOB3

•50% forage and 50% concentrate =>LLOSC1, LLOSD1, LLOSC3 and LLOSA2

Obtaining bacteria - 4 Holstein : Two of them - 50% forage and 50% concentrate and Two of them - 100% forage

Bulk => Corn silage => 7.1% CP

Concentrate: 76% corn, 20% soybean meal, 1% urea, 2% calcary and 1% mineral salt => 13.8% CP



There were evaluated growths of strains in the presence of substrates: arabinose, cellulose, glucose, cellobiose, xylose, fructose and lactose.

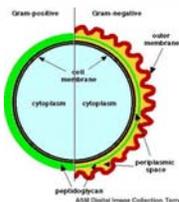
Statistical Analysis: Bayesian analysis => WinBUGS PACKAGE used to Gibbs chains of 20,000 and 30,000 iterations. The credibility intervals were estimated at 95%.

RESULTS AND DISCUSSION

Table 1. Percentage of pure strains of bacteria that have presented Gram-positive and Gram-negative staining, tolerant to different LLOS¹ products based on propolis, incubated in different proportions of roughage: concentrate

LLOS product	Gram (+) estimated	Gram (-) estimated	Confidence interval of Gram (+)	
			2.5%	97.5%
100% corn silage				
LLOSC1	74.9	25.1	58.0	88.8
LLOB3	83.9	16.1	67.4	95.3
50% corn silage and 50% concentrate				
LLOSD1	80.9	19.1	62.2	94.2
LLOSC3	73.7	26.3	52.3	90.3
LLOSC1	83.4	16.6	66.8	95.0
LLOSA2	59.8	40.2	29.5	86.0
Total	80.9	19.1		

¹ LLOS: product based on extract of propolis with extraction under different alcoholic levels (1, 2 and 3) and different concentration of propolis (A, B, C and D), LLOSC1, LLOB3, LLOSD1, LLOSC3, and LLOSA2.



It acts different ionophore - RNA polymerase

CONCLUSÕES

The experimental procedure adopted selected a bacterial population consisting of Gram-positive strains.

The diet with 100% forage both additives (LLOSC1 and LLOB3) can be used.

In diets with 50:50 ratio of roughage:concentrate, additives LLOSC3 and LLOSA2 are the most promising for in vivo studies.

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