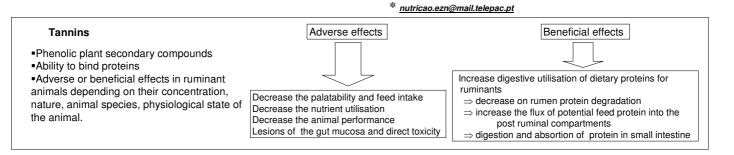


Instituto Nacional de Investigação Agrária e das Pescas

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Effect of *Cistus ladanifer* L. tannins on digestion, ruminal fermentation and microbial protein synthesis in sheep.

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OBJECTIVES

Measure the effect of a purified extract of tannins of *Cistus ladanifer* L. on:

≻ruminal degradability,

≻Fermentative parameters

>intestinal and apparent digestibility

rumen microbial protein synthesis in sheep

Table 1. Chemical composition of soybean meal treated with different doses of a tannin extract of *Cistus ladanifer* L. (n = 3).

	Experimental diets			SIG ¹		
	S0	S1.5	S3	310		
DM (%)	88.2	87.8	82.2	NS		
N (%DM)	7.43	7.57	7.33	NS		
Soluble N (%N)	11.8 ª	7.70 ^b	7.20 ^b	***		
N-ADF (%N)	1.51	1.85	2.23	NS		
NDF (%DM)	15.4 ^b	17.1 ^{ab}	18.5 ª	*		
¹ SIG - Significance, NS - not significant, * P < 0.05, ** P< 0.01, *** P<0.001;						

means in the same row with different superscripts differ significantly (P<0.05)

RESULTS

The addition of tannins:

- > Induced a decrease in the soluble-nitrogen of the soybean meal
- Induced a decrease in the rapidly degradable fraction "a" of crude protein and an increase in the slowly degradable fraction "b"
- Did not change the effective degradability and rumen undegradable protein
- Induced a decrease in the microbial nitrogen yield
- Did not affect the intestinal digestibility
- Did not affect the apparent digestibility of DM
- Did not affect the apparent digestibility of DM, OM, NDF, ADF and CP
 Did not affect the rumen pH, NH3-N, and volatile fatty acid production.
- Did not affect the runnen ph, NH3-N, and Volatile fatty acid production





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CONCLUSIONS

In this study the level of tannins included did not cause the desirable rumen effects:

• the flux of feed protein into the post-ruminal compartments did not increase and

• the microbial protein yield decreased.

 Table 2. Nitrogen (N) intake and excreted in feces and urines, apparent nitrogen balance, ruminal degradation parameters of protein, effective degradability at k= 0.08.h-1 (ED), rumen undegradable protein (RUP), microbial protein synthesis (MP), intestinal digestibility (ID) and apparent digestibility (CUD) of protein.

S0	• · -					
-	S1.5	S3				
81.0	85.1	81.7	NS			
27.9	29.0	25.4	NS			
34.0	35.9	35.6	NS			
19.1	20.2	20.7	NS			
Ruminal degradation parameters:						
0.17 ^a	0.11 ^{ab}	0.02 ^b	*			
0.81 ^a	0.89 ^{ab}	0.96 ^b	*			
0.055	0.062	0.083	NS			
0.51	0.49	0.50	NS			
0.49	0.51	0.50	NS			
6.11ª	5.40 ^{ab}	3.69 ^b	*			
10.0	9.07	6.09	0.08			
0.78	0.74	0.74	NS			
0.58	0.58	0.56	NS			
	27.9 34.0 19.1 arameters 0.17 ^a 0.81 ^a 0.055 0.51 0.49 6.11 ^a 10.0 0.78 0.58	27.9 29.0 34.0 35.9 19.1 20.2 arameters: 0.11 ^{ab} 0.81 ^a 0.89 ^{ab} 0.055 0.062 0.51 0.49 0.49 0.51 6.11 ^a 5.40 ^{ab} 10.0 9.07 0.78 0.74 0.58 0.58	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			

significantly (P<0.05); a- soluble or rapidly degradable fraction, b- slowly degraded fraction, c- degradation rate of the b fraction.

MATERIAL AND METHODS

Addition of tannin extract to the soybean meal supplement – samples of soybean meal (6 kg) were sprayed with mixtures (1:9 w/v) of tannins extract diluted in acetone/water solution (70:30 v/v) in order to obtain soybean meal with 0 (S0), 1.5 (S1.5) and 3% (S3) of tannins.

Metabolic trial

Animals - three rumen cannulated Merino rams

Experimental design - 3 x 3 Latin square design

- Feedstuffs Basal diet -oat straw (600g) + manioc (300g) and
 - Soybean meal (100 g) with tannin extracts (0, 1.5 or 3%).

Nutritive parameters Apparent digestibility

Nitrogen balance

In situ degradability of protein (Ørskov and McDonald,1979) Intestinal digestibility of protein (Calsamiglia and Stern ,1995)

Ruminal microbial protein synthesis (Chen and Gomes, 1992) Ruminal pH and volatile fatty acids (Jouany,1981)

References Calsamiglia S. and Stern M. D., 1995. J. Anim. Sci. 73: 1459-1465. Ørskov E.R. and McDonald I., 1979. J. Agric. Sci. (Camb.) 92: 499-503. Chen X.B. and Gomes M.J., 1992. Int. Feed Resources Unit, Rowett Res. Inst., Occasional Publ. 19p.

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