

# Effect of soybean meal treated with *Cistus ladanifer* condensed tannins on growth, carcass and meat quality of lambs

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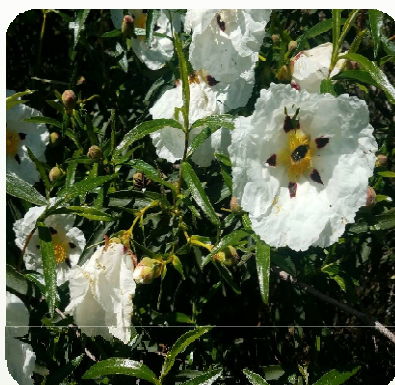


Cistus | Rumen

## BACKGROUND

### Condensed Tannins

- Phenolic plant secondary compounds
- Increase digestive utilisation of dietary proteins for ruminants
  - Protect proteins under the rumen pH conditions  
Preventing their excessive microbial degradation
  - Tannin-protein complexes are dissociated in the abomasum  
Increasing the absorption of amino acids in the small intestine



### *Cistus ladanifer* L.

- Abundant shrub in marginal fields of Mediterranean countries
- Without regular economic exploitation
- Highly combustible => forest fires
- Not grazed due to low nutritive value
- High levels of condensed tannins (9% DM)

## OBJECTIVES

To evaluate the effect of treating soybean meal (SBM) with an extract of *C. ladanifer* condensed tannins (CT) on lambs growth, carcass and meat quality.

## CONCLUSIONS

*C. ladanifer* CT can be used as feed additive to improve feed protein utilization and hence to reduce the feed costs, without compromising lamb performance.

## RESULTS

Table 1. Nutrient intake and growth performance of lambs fed with the experimental diets

	Diets			P-value
	Control	RP	RPCT	
Intake, g/d				
DM	908	925	935	0.44
Crude Protein (CP)	139 <sup>b</sup>	109 <sup>a</sup>	103 <sup>a</sup>	<.001
Initial BW (kg)	20.3	22.2	21.8	0.09
Slaughter BW (kg)	29.1 <sup>b</sup>	27.0 <sup>a</sup>	28.1 <sup>ab</sup>	0.01
ADG (g/d)	219 <sup>b</sup>	176 <sup>a</sup>	199 <sup>ab</sup>	0.01
Feed conversion ratio	3.99 <sup>b</sup>	5.51 <sup>a</sup>	4.72 <sup>ab</sup>	0.03

ADG – Average daily gain

Feed conversion ratio – DM intake/weight gain

Table 2. Carcass traits and meat quality of lambs fed with the experimental diets.

	Diets			P-value
	Control	RP	RPCT	
<b>Carcass traits</b>				
Hot carcass wt (kg)	14.5	13.5	14.1	0.09
Cold carcass wt (kg)	13.9	13.0	13.5	0.08
Dressing (%)	49.1	49.4	49.8	0.86
KKCF (%)	2.06	2.43	2.56	0.11
Higher priced cuts (%)	55.4 <sup>a</sup>	54.8 <sup>ab</sup>	54.2 <sup>b</sup>	0.03
<b>Shoulder and chump composition (%)</b>				
Muscle	58.4	57.0	57.2	0.56
Muscle/Bone	3.18	3.16	3.01	0.55
Intermuscular fat/ Subcutaneous fat	1.01	0.91	1.06	0.23

Physical, chemical and sensory characteristics of lamb's meat



- Colour parameters (L\*, a\*, b\*);
- Colour stability;
- Crude protein;
- pH;
- Cooking losses;
- Shear force;
- Sensory panel

Characteristics not affected by treatments

- Table 1- With CT inclusion a positive response on growth and on feed conversion ratio was obtained.
- Table 2- Only differences are observed in high priced cuts being lower with RPCT diet.

## METHODOLOGY

### Preparation of tannic extract

- *C. ladanifer* - leaves and soft stems milled (1 mm)
- Acetone: water (70:30) in the proportion of 1:10
- Acetone evaporation
- Aqueous extract washed with petroleum ether
- Freeze-dried

### Animal trial

#### 24 lambs individually housed

- Live weight - 21.1 ± 1.6 kg
- 8 lambs/diet
- Diets – hay and concentrate (15:85)
- Concentrate: Control (16% CP) ; RP (12% CP) ; RPCT (12% CP treated with *C.ladanifer* CT)
- Feed offered daily- an equivalent quantity to 4% of the each animal weight.
- Adaptation period – 7 days ; Experimental period - 5 weeks

Evaluation of the effects on animal performance, carcasses, meat quality