Effect of Cistus ladanifer L. tannins as silage additives

Maria Teresa P. Dentinho[1,2,], K. Paulos[1], A.T. Belo[1], P. V. Portugal[1] , S. Alves[2,3], O. C. Moreira[1], J. Santos-Silva[1,2], R.J.B. Bessa[2,3]*

[1]Unidade Estratégica de Investigação e Serviços em Produção e Saúde Animal, INIAV, Fonte Boa, 2005-048 Vale de Santarém, Portugal
[2]CIISA, Centro de Investigação Interdisciplinar em Saúde Animal, Faculdade de Medicina Veterinária, Pólo Universitário do Alto da Ajuda, 1300-477 Lisboa, Portugal
[3]Faculdade de Medicina Veterinária, Universidade Lisboa, Avenida Universidade Técnica, 1300-477 Lisboa, Portugal

*E-mail: teresa.dentinho@iniav.pt

Cistus | Rumen

OBJECTIVES

Evaluate the effect of an extract of *Cistus ladanifer* condensed tannins (CT) as additive of lucerne silage on:

- **Silage fermentative parameters;**
- **Silage protein utilization by sheep.**

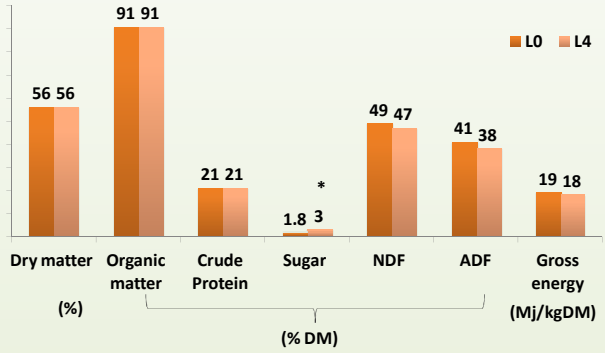
CONCLUSIONS

Condensed Tannins have potential to be used as silage additives:

- **Reduce proteolysis in silo**
- **Increases the efficiency of using absorbed N**
  - **⇒ reduce apparent N digestibility but not affect N retention.**
- **Shift of N excretion from urine to feces ⇒ environmentally beneficial**

RESULTS

Chemical composition and fermentative parameters of lucerne silage treated with 0 (L0), and 40g/kg (L4) of condensed tannin of *C. ladanifer* (n = 6)

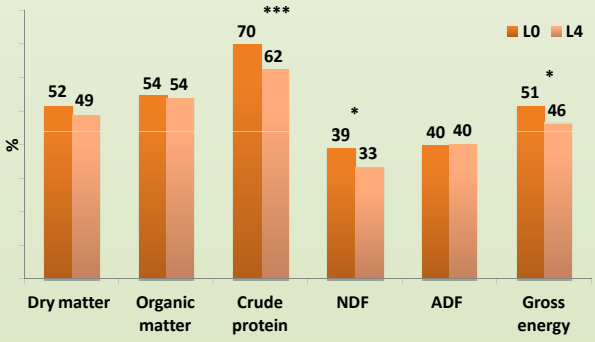


	Experimental diets		*P-value*
	L0	L4	
pH	5.1	5.3	NS
Lactic acid (g/kg DM)	**8.6**	**5.4**	*
Acetic acid (g/kg DM)	1.7	1.2	NS
Propionic acid (g/kg DM)	**2.4**	**2.0**	*
Butyric acid (g/kg DM)	0.3	0.3	NS
NH_3- N (% total N)	9.7	8.5	NS
Soluble-N (% total N)	**46**	**41**	**
True protein (% total N)	**49**	**52**	*
Non protein N (% total N)	**51**	**48**	*

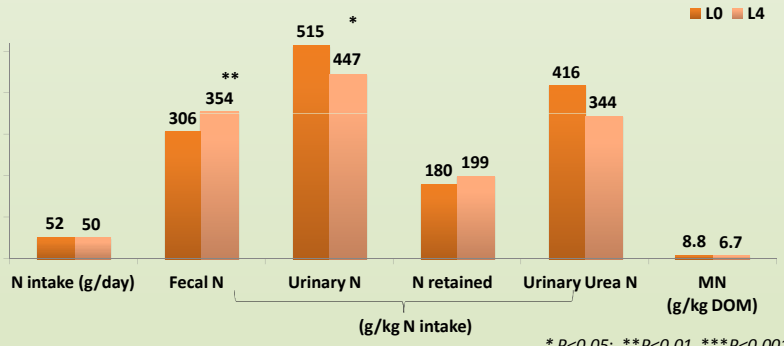
** P<0.05; **P<0.01, ***P<0.001*

- **Silages with high levels of dry matter and protein**
- **Reduced fermentation in both silages ⇒ low concentrations of fermentation products.**
- **CT inclusion ⇒ proteolysis reduction (⇩ soluble-N, ⇧ true protein)**

Apparent digestibility of the experimental diets (n=6)



Nitrogen balance and microbial nitrogen synthesis (MN)



** P<0.05; **P<0.01, ***P<0.001*

- **With CT inclusion - Protein and energy apparent digestibility decreased**
- **N retention was not affected ⇒ Fecal N loss compensated by lower urinary N**

METHODOLOGY

Silages

- Lucerne silage with molasses (9 l /ton) without CT (L0).
- Lucerne silage with molasses (9 l / ton) with 40 g of CT /kg of DM (L40)

- Ensiling time - 124 days

Chemical analysis - Dry matter, ash, protein, sugar, NDF, ADF, gross energy.
Fermentative parameters- pH, NH_3-N, soluble N, non protein N, lactic acid acetic, propionic and butyric acids.

Metabolic trial

Animals - six crossbred Romani sheep - 69 5 kg live weight
Metabolic cages =>
Experimental design - three simultaneous 2 x 2 Latin Square
Feedstuffs –
- Lucerne silage L0.
- Lucerne silage L40

Nutritive parameters
Apparent digestibility, nitrogen balance, microbial protein synthesis (Chen and Gomes, 1992).

References:
Chen X.B. and Gomes M.J., 1992. Int. Feed Resources Unit, Rowett Res. Inst., Occasional Publ. 19p.

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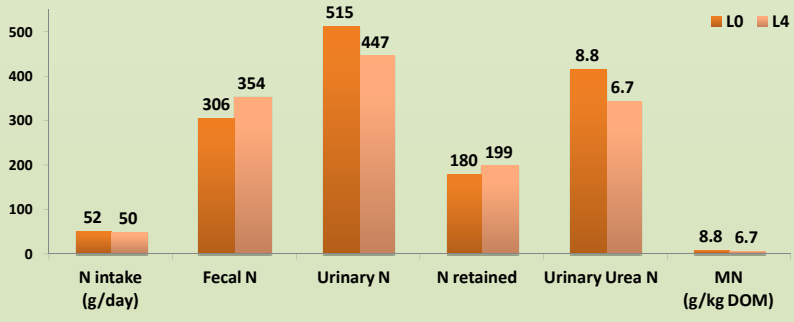
L0
L4
500
400
300
200
100
0
52
50
306
354
515
447
180
199
8.8
6.7
8.8
6.7
N intake (g/day)
Fecal N
Urinary N
N retained
Urinary Urea N
MN (g/kg DOM)