The type of condensed tannins affected differently growth and meat lipid oxidation of light lambs

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INTRODUCTION

Traditional lamb meat production in Mediterranean countries is based on:

LIGHT LAMB

BW < 25 kg

Age < 90 d

- During lactation, ewes and lambs are stalled indoors
  - Ewes fed hay or straw + concentrates
  - Lambs fed milk (45-50 days old)
- After weaning, lambs fed high-concentrate diet

To obtain a homogenous product " Light lamb of Aragon" , Protected Geographical Indication (PGI)

INTRODUCTION

The former is the usual intensive system in Mediterranean area

- ✓ Grazing good quality forages, as alfalfa, allows a good performance of lactating ewes (Álvarez-Rodriguez et al. 2010)
- ✓ Grazing Sainfoin could be an interesting alternative as it has high protein content and condensed tannin.

Medicago sativa

Onobrychis viicifolia

- Multiannual legumes
- Widely used in Mediterranean areas

INTRODUCTION

Oxidation is one of the main reason for quality deterioration in meat

To postpone it, the addition of antioxidant has emerged as a strategy

✗ Synthetic

✓ Natural

Quebracho ← Condensed tannins

OBJETIVE

The aim of this study was to evaluate:

→ The effect of the feeding treatment during **LACTATION** period, (alfalfa, sainfoin, indoor)

→ The inclusion of Quebracho in the concentrate during **FATTENING** period

On the **performances** of light lambs and on the **lipid oxidation** of meat

MATERIAL AND METHODS

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Lactation period

After lambing, ewe-lamb pairs were ramdomly assigned according to ewe´s BW and BCS to one of three treatments:

Ewes and lambs rotationally grazed paddocks

They were changed to a new paddock fortnightly to ensure that the stubble height was above 10 cm

Ewes and lambs were housed and were fed with a total mixed ration

MATERIAL AND METHODS

Fattening period: 2 type of concentrate

Weaning → Slaughter 22-24 kg

CONTROL	QUEBRACHO 5%
11.9 MJ/kg FM, 17.5% CP	11.7 MJ/kg FM, 17.5% CP

MATERIAL AND METHODS Controls and analysis

Body weight

Lambing 0 d → Weaning 42 d → Slaughter 70 d

Lactation | ADG | Fattening

Concentrate intake

MATERIAL AND METHODS Controls and analysis

Hot carcass weight

Kidney fat

Cold carcass weight

Dressing percentage

Intramuscular Fat

Lipid oxidation: TBARS

Placed in 6 trays

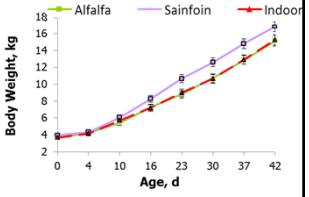
Darkness at 4 ºC

2 5 7 9 12 14 days

RESULTS AND DISCUSSION: Production parameters

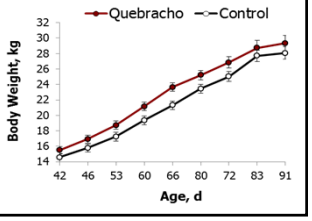
Lactation period

- ✓ ADG: > Sainfoin †
- ✓ BW at weaning: NS
- ✓ Concentrate intake: > Indoor



Fattening period

- ✓ ADG: > Quebracho †
- ✓ BW at slaughter: > Quebracho †
- ✓ Concentrate intake: > Quebracho *



RESULTS AND DISCUSSION: Carcass characteristics

	Lactation			Fattening		P-value	
	Alfalfa	Sainfoin	Indoor	QUE	Control	L	F
Hot carcass weight, kg	10.7^{b}	10.8^{b}	11.4^{a}	11.1	10.8	0.03	0.16
Cold carcass weight, kg	10.4^{b}	10.5^{b}	10.9^{a}	10.9	10.5	0.03	0.10
Dressing percentage, %	45.0^{b}	45.7^{b}	47.8^{a}	46.4	46.0	0.001	0.57
Kidney Fat, g	124^{b}	140^{b}	227^{a}	167	160	0.001	0.66

RESULTS AND DISCUSSION:

Intramuscular fat content

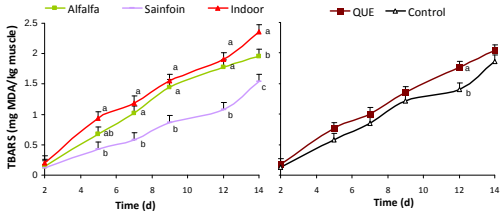
Lactation period

Indoor > Alfalfa, Sainfoin

Fattening period

NO EFFECT

Lipid oxidation



CONCLUSIONS:

- The diet during the lactation period was the **most important** effect
- Lamb with their dams in sainfoin paddocks during lactation is an advisable system:
  - Improves slightly weight gains
  - Extends the meat shelf life
- The inclusion of Quebracho in the concentrate during the fattening period:
  - Tended to increase lamb´s weight
  - No effect on meat shelf life

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The aim of this study was to assess the effect of the feeding during lactation and the inclusion of condensed tannins (CT) in the concentrate during the fattening period on productive parameters and on meat lipid oxidation of light lambs. At parturition, 63 Rasa Aragonesa ewe-lamb pairs were randomly distributed in 3 treatments. During the lactation period, one group was housed indoors and received a total mixed ration (TMR), a second group was stocked on alfalfa (Medicago sativa) paddocks (Alfalfa) and the third group was stocked on sainfoin (Onobrychis viciifolia) paddocks (Sainfoin). At day 42, the lambs were weaned and half of the lambs of each feeding treatment was fed a commercial concentrate (Control; 11.9 MJ/kg FM, 17.5% crude protein) or a commercial concentrate with 5% of Quebracho (QUE, SYLVAFEED ByPro Q, Spain, with 75% of CT; 11.7 MJ/kg FM, 17.5% crude protein). When lambs reached the target slaughter weight (22-24 kg BW), they were slaughtered. Carcass characteristics were registered and samples of the Longissimus thoracis et lumborum muscle were obtained to study the intramuscular fat content and the lipid oxidation of the meat. The feeding treatment during lactation slightly affected weight gains and BW at slaughter of lambs. Sainfoin treatment tended to improve the BW at slaughter ($P=0.09$). TMR lambs had the heaviest carcasses and greater dressing percentage and kidney fat depots, Sainfoin lambs intermediate, and Alfalfa lambs the lowest. Regarding lipid oxidation of meat, Sainfoin lambs presented the lower level from 5 d until 14 d of storage ($P<0.05$). The inclusion of Quebracho in the concentrate tended to improve the weight gains during fattening period and the BW at slaughter ($P<0.1$) at the same age ($P>0.05$) but did not affect lipid oxidation.

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