

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

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CENTRO DE INVESTIGACIÓN Y TECNOLOGÍA  
AGROALIMENTARIA DE ARAGÓN

# 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-Rodríguez et al. 2010)

*Medicago sativa*



*Onobrychis viicifolia*



- Multiannual legumes
- High protein content
- Widely used in Mediterranean areas

✓ Grazing Sainfoin could be an interesting alternative as it is similar to alfalfa except for the content of condensed tannins

# INTRODUCTION

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



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



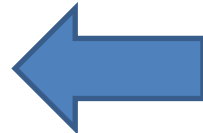
Synthetic

Natural



Condensed tannins

Quebracho



# OBJETIVE

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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



ZARAGOZA



# MATERIAL AND METHODS



RASA ARAGONESA  
SPRING-LAMBING  
63 EWES  
+  
63 MALE LAMBS

# MATERIAL AND METHODS

## ➔ Lactation period

After lambing, ewe-lamb pairs were randomly 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**

11.9 MJ/kg FM, 17.5% CP

**QUEBRACHO**

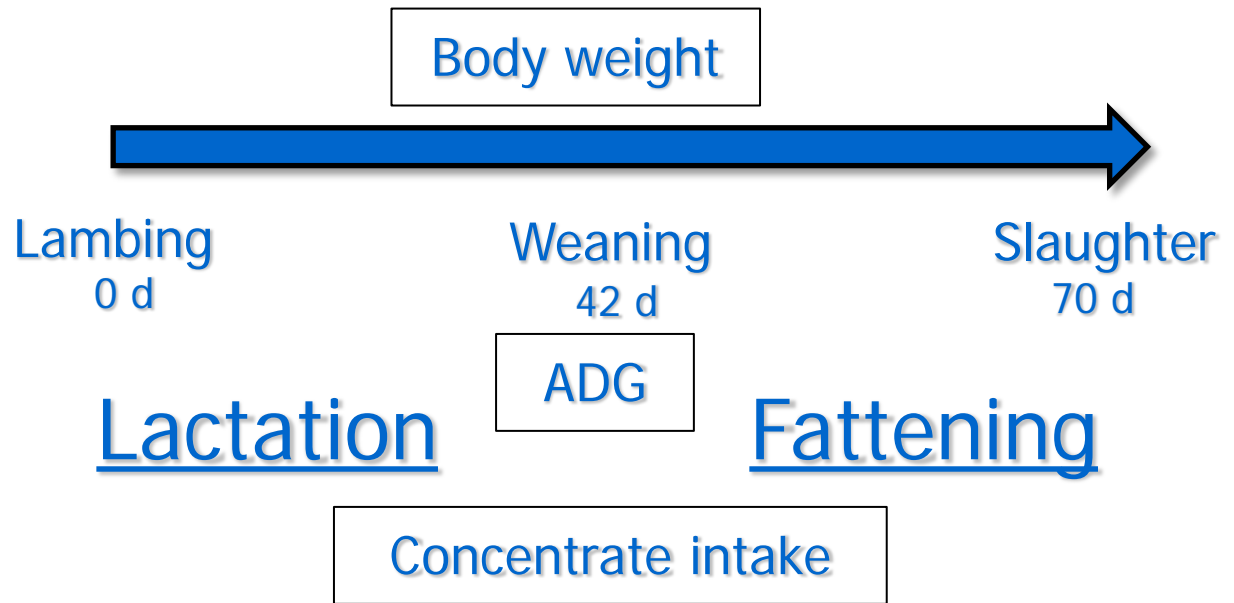
5%

11.7 MJ/kg FM, 17.5% CP



# MATERIAL AND METHODS

## Controls and analysis



# MATERIAL AND METHODS Controls and analysis



Hot carcass weight  
Kidney fat  
Cold carcass weight  
Dressing percentage

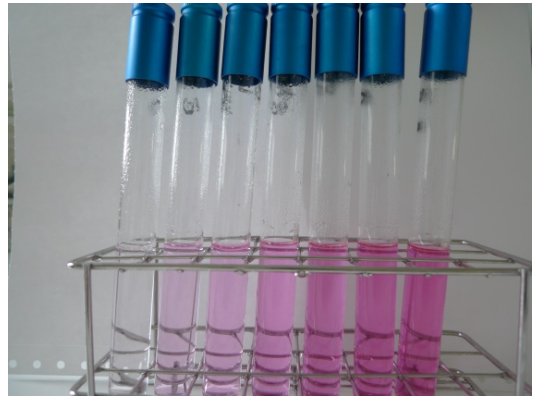


Intramuscular Fat

Lipid oxidation: TBARS



Placed in 6 trays  
Darkness at 4 °C  
2 5 7 9 12 14 days



# RESULTS AND DISCUSSION

## Production parameters

### ➔ Lactation period

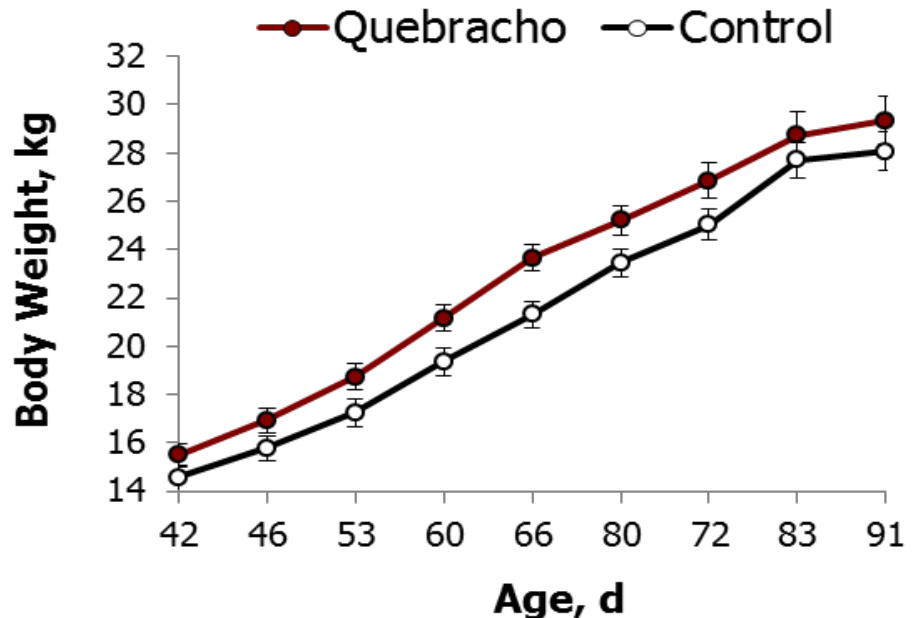
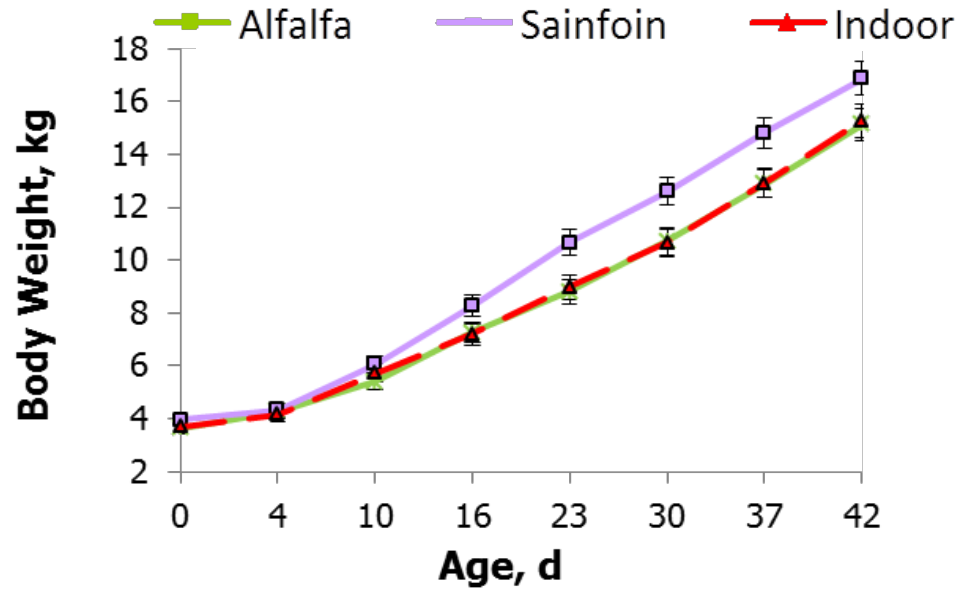
- ✓ ADG: > Sainfoin †
- ✓ BW at weaning: NS
- ✓ Concentrate intake: > Indoor

†=P<0.1, NS=P>0.05

### ➔ Fattening period

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

†=P<0.1, \*=P<0.05



# RESULTS AND DISCUSSION

## Carcass characteristics

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



# RESULTS AND DISCUSSION

## Intramuscular fat content

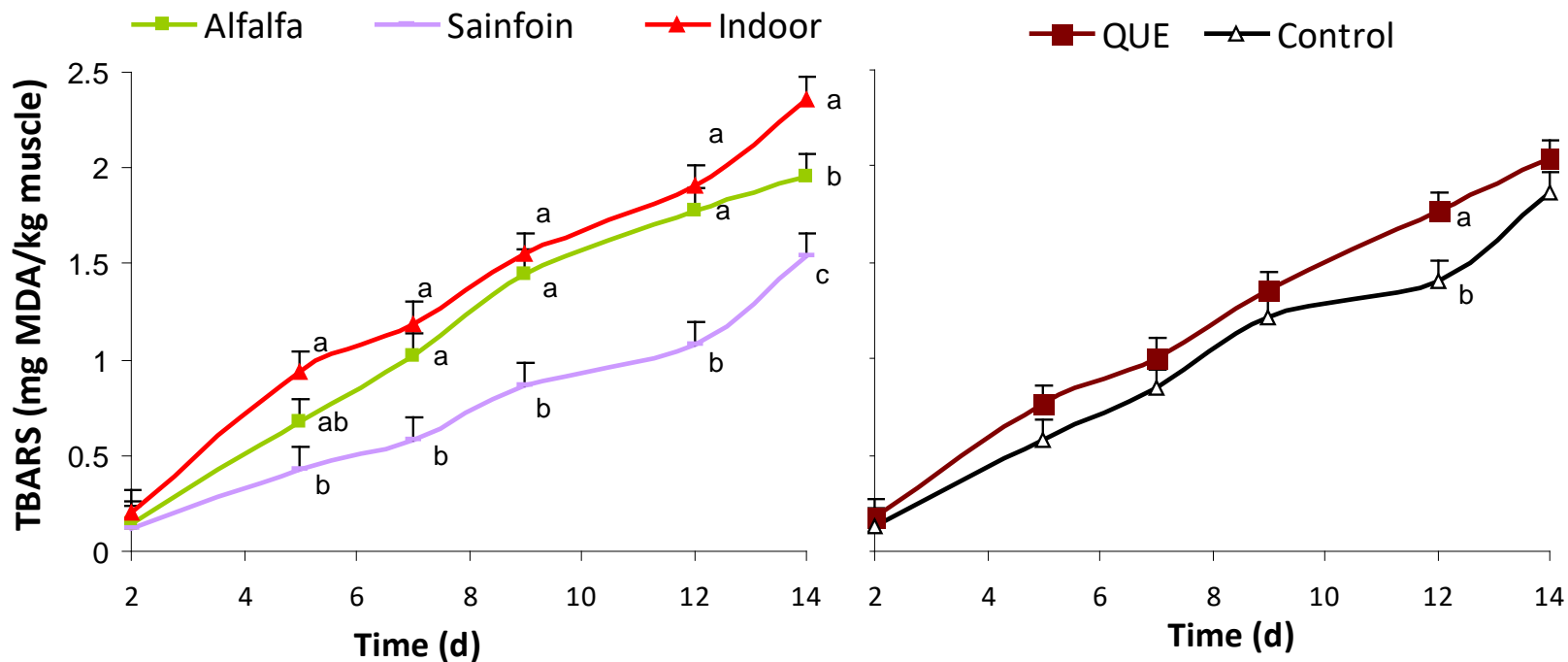
Lactation period

Fattening period

Indoor > Alfalfa  
Sainfoin

NO EFFECT

## Lipid oxidation



# CONCLUSIONS

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- The diet during the lactation period was the **most important effect**
- Lambs with dams in sainfoin paddocks during lactation is an advisable system:
  - Improved slightly weight gains
  - Extended the meat shelf life
- The inclusion of Quebracho in the concentrate during the fattening period:
  - Tended to increase lamb's weight
  - Did not have effect on meat shelf life



A herd of white sheep is grazing in a lush green field filled with small pink flowers. The sheep are of various sizes, including several adults and a few lambs. They are all facing left, and some are actively eating the vegetation. The scene is brightly lit, suggesting a sunny day. A semi-transparent white box with a green border is overlaid at the bottom of the image, containing text.

Thanks for your attention

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