Effect of condensed tannins of sainfoin on the fatty acid profile of ewe's milk and lamb's meat

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Twenty ewe-lamb pairs were used to evaluate the effect of the condensed tannins (CT), through the inclusion of polyethylene glycol (PEG), in the diet of lactating ewes on the fatty acid (FA) profile of their milk and the meat of their suckling lambs. The feeding treatments were: fresh sainfoin (*Onobrychis viciifolia*; SF n=10) and fresh sainfoin plus PEG (SF+PEG, n=10) to bind and deactivate the CT of sainfoin. Ewes were milked weekly and milk samples were collected until the lambs reached the target slaughter weight (11±0.2 kg) with an average age of 27 days. Milk and meat FA were determined by gas chromatography (expressed as % of total FA identified) and sums and ratios of FA were calculated. Regarding milk FA, the inclusion of PEG increased C18:0 and C18:2 9c,11t, and n-6:n-3 ratio during week 1 and 2 of lactation ($P<0.05$) but not thereafter. Throughout lactation, SF+PEG ewes presented higher percentage of C16:0 and lower of C18:2 n-6, C18:3 n-3, C20:5 n-3 and total polyunsaturated FA (PUFA; 6.5% vs 5.9% for SF and SF+PEG respectively; $P<0.05$) than SF ewes. Therefore, the CT from sainfoin inhibited the ruminal biohydrogenation. The effect of CT on the FA of the meat of suckling lambs was milder than the effect observed in the milk, due to the *de novo* synthesis of FA in lamb muscle. The inclusion of PEG decreased C18:3 n-3 (2.3% vs 1.7% for SF and SF+PEG respectively; $P<0.01$) and increased C18:2 9c,11t (0.58% vs 0.71% for SF and SF+PEG respectively; $P<0.01$). In conclusion, CT from sainfoin improved milk quality because it increased PUFA and decreased n-6:n-3 ratio, and to a lesser extent they improved the meat quality of suckling lamb.

Potentials of milk performance data as indicator for targeted selective treatment in Lacaune sheep

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Anthelmintic resistance is a major threat in farming of small ruminants worldwide. One approach to slow down the development of anthelmintic resistance is targeted selective treatment (TST), where a part of animals is left unexposed to anthelmintic treatment and thus providing refugia for susceptible parasites. Closely linked to the successful implementation of TST is the identification of animals in need of treatment. In dairy goats it has been proposed to use milk yield as TST indicator, focussing treatment on high yielding dairy goats. In dairy sheep the relation between milk performance and infection of gastrointestinal nematodes (GIN) is not yet well known. The aim of this study was therefore to investigate the general relation between milk yield and GIN infection in a Swiss Lacaune dairy sheep subpopulation and, based on this, to evaluate milk yield data as a potential TST indicator in dairy sheep. A field study was performed including 1,159 lactating Lacaune dairy ewes on 15 dairy sheep farms in Switzerland. All ewes were sampled once between August and December 2019, when they had exceeded the 70th day of lactation. For each ewe the nematode egg excretion per gram faeces (EPG) was determined and individual milk performance data was obtained closely time-related to the date of faecal sampling. Coprocultures of pooled faecal samples were conducted to determine the proportion of *Haemonchus contortus* on farm level. A linear mixed model revealed that EPG increased significantly with increasing daily milk yield ($P<0.01$), indicating high yielding ewes to be less resistant to GIN infections than low yielding ewes. The effect was most pronounced in the earlier stage of lactation, but remained within a moderate range. The other included fixed effects milk protein content, lactation day, lactation number and the proportion of *H. contortus* did not show significant relations with EPG. The results suggest the possibility of using milk yield data as TST indicator in dairy sheep. In the frame of H2020 project SMARTER no. 772787.

Session 11. Dairy sheep and goat systems: new research in genes, nutrition and management

Date: Tuesday 1 December 2020; 13.45 – 17.30
Chair: Tzamaloukas / Keane

Theatre Session 11

Poster Session 11

Book of Abstracts of the 71st Annual Meeting of the European Federation of Animal Science

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Virtual Meeting
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Book of Abstracts of the 71st Annual Meeting of the European Federation of Animal Science

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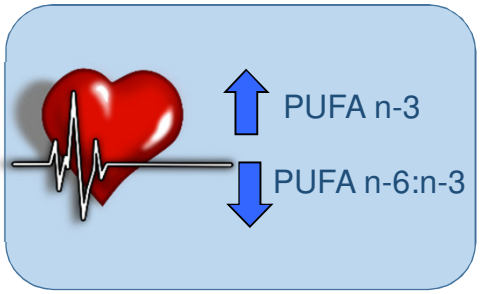
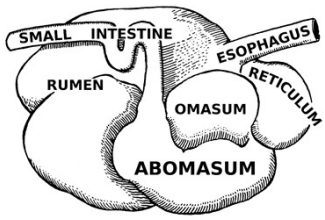
Introduction



SFA
PUFA n-6:n-3
CLA
C18:3 n-3



Introduction

CONDENSED TANNINS (CT) → INHIBIT biohydrogenation → PUFAs

SAINFOIN
(*Onobrychis viciifolia*)
Rich in CT

LACTATION

↑PUFA
↑PUFA n-3
↓n-6:n-3

Lobón et al. 2017

Polyethylene glycol (PEG)

↓

Bind and deactivate the CT

Objective

Evaluate the inclusion of PEG in the diets of lactating ewes fed fresh sainfoin on the fatty acid profile of their milk and the meat of their suckling lambs

Material and methods

Spring of 2019

SAINFOIN → Water

SAINFOIN + PEG → 50 g PEG/ 100 ml water

200 g Barley

	Sainfoin
Dry matter, %	21.3 ± 0.1
Crude protein, %	11.6 ± 0.2
Neutro detergent fiber, %	36.6 ± 0.5
Acid detergent fiber, %	26.0 ± 0.4
CT, g sainfoin.eq/kg DM	45.2± 2.1

Material and methods

Lactation period

Lambing

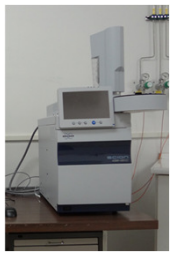
10-12 kg Slaughter

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 d

4ºC
24 h
Darkness

FA analysis

Extraction and methylation
Determination: GC



Statistical analysis

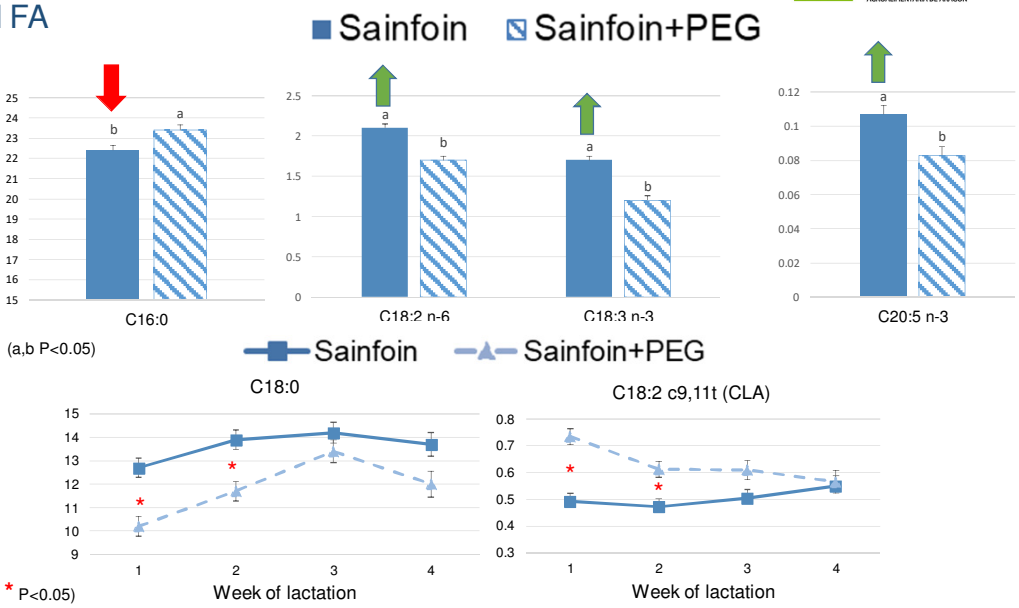
Milk FA: mixed model
Meat FA: General lienar model

Results

>100 individual FA

≈ Fat (6.53 %)

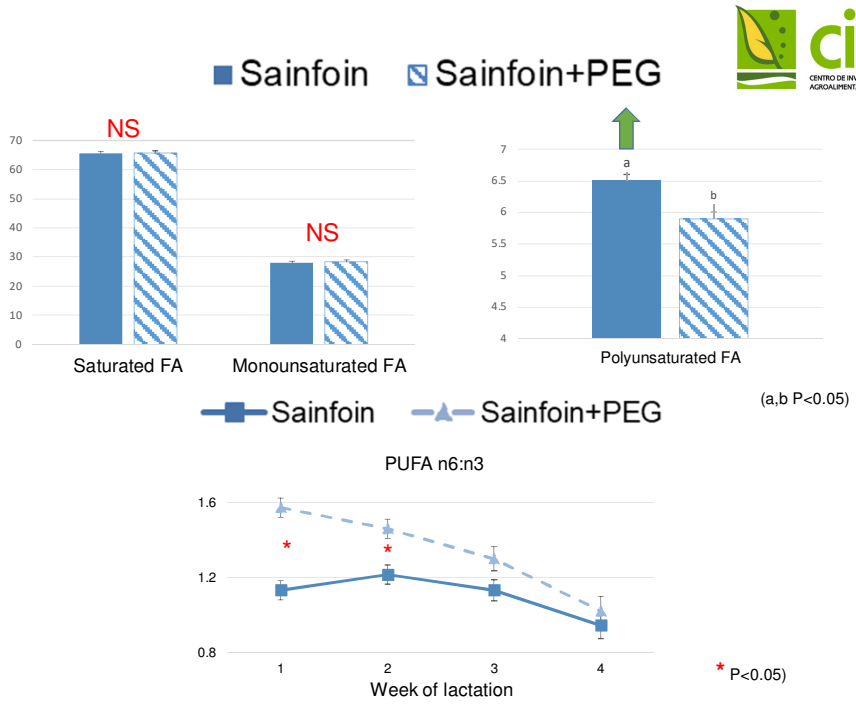
% identified FA



Results

Main categoires

% identified FA

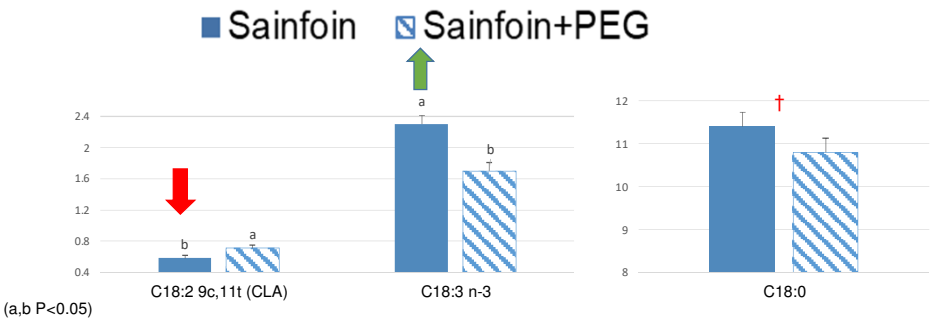


Results

>100 individual FA

≈ IMF (2.3 %)

% identified FA



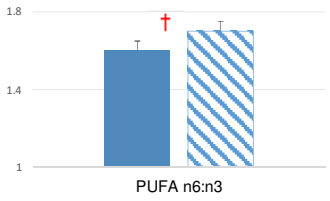
(a,b P<0.05)

Main categoires

SFA →NS

MUFA →NS

PUFA → NS



Conclusion

The inclusion of fresh sainfoin in the diet of lactating ewes would be advisable to improve the milk FA profile, as its CT increased the PUFA content and decreased the n-6:n-3 ratio.
However, these beneficial effects were less reflected in the meat of their suckling lambs.

Thank You!

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