

**Effect of proanthocyanidins of sainfoin on secondary compounds in milk and suckling lamb meat***M. Blanco, C. Baila, M. Joy, J.R. Bertolín, I. Casasús and S. Lobón**Cir Invest y Tecnol Agroal Aragon (CITA), Universidad de Zaragoza, Montañana 930, 50059 Zaragoza, Spain; slobon@cita-aragon.es*

Proanthocyanidins may exert a protective effect on polyphenols, carotenoids and liposoluble vitamins in the milk of the ewe and therefore increase their deposition in the tissues of the suckling lamb. The aim of this study was to evaluate the effect of proanthocyanidins of sainfoin (*Onobrychis viciifolia*), with the inclusion of polyethylene glycol (PEG), on the secondary compounds in the milk of the ewe through lactation and the contents in the meat of the suckling lamb. For that, 20 lactating Rasa Aragonesa ewes were individually fed fresh sainfoin *ad libitum* plus 200 g/d of barley. Half of the ewes were orally-dose twice daily PEG diluted in water (50 g PEG/100 ml of PEG 4000) and the other half only water. The suckling lambs had continuous access to their dams until they reached 11 kg of live weight, when they were slaughtered. After 24 h of cooling, the Longissimus thoracis muscle was sampled. The intake of secondary compounds was similar between treatments ( $P>0.05$ ). Regarding the effect on polyphenols, the inclusion of PEG increased the concentration in milk throughout lactation (43 vs 51  $\mu\text{g/g}$  milk;  $P<0.01$ ) and their content in meat of the suckling lamb (71 vs 82  $\mu\text{g/g}$ ;  $P<0.05$ ). Similarly, the inclusion of PEG increased retinol concentration in milk (0.7 vs 0.9  $\mu\text{g/g}$ ;  $P<0.05$ ), however, retinol content in meat of the suckling lamb did not reflect this difference ( $P>0.05$ ). The inclusion of PEG tended to reduce lutein in milk throughout lactation (12 vs 7 ng/ml milk;  $P<0.10$ ) and in the muscle content of the suckling lamb (12.7 vs 4.6 ng/g;  $P<0.10$ ). Regarding tocopherols in milk,  $\alpha$ - and  $\delta$ -tocopherols were not affected by the inclusion of PEG ( $P>0.05$ ). The concentration of  $\gamma$ -tocopherol evolved differently through lactation with the inclusion of PEG ( $P<0.01$ ), however there were no differences within a week between treatments. The inclusion of PEG did not affect the content of  $\alpha$ -,  $\gamma$ - and  $\delta$ -tocopherol in meat of the suckling lamb.

**The investigation of fatty acid profile of Chios sheep during lactation***Z. Basdagianni<sup>1</sup>, C. Karaiskou<sup>1</sup>, E. Kasapidou<sup>2</sup> and M.A. Karatzia<sup>3</sup>**<sup>1</sup>School of Agriculture, Aristotle University of Thessaloniki, Department of Animal Production, Thessaloniki, 54124, Greece, <sup>2</sup>University of Western Macedonia, Department of Agriculture, Florina, 53100, Greece, <sup>3</sup>Research Institute of Animal Science, HAO-Demeter, Paralimni, 58100, Greece; karatzia@rias.gr*

The investigation of fatty acid profile and genetic potential of Chios sheep is vital for animal selection and production of quality dairy products. In the present study, test-day milk yield records of 100 Chios breed sheep from one farm participating in the Chios Sheep Breeders Cooperative 'Macedonia' which implements the genetic improvement program, were analysed for milk quality. Six individual milk samples were collected monthly from February to July for the determination of milk fatty acid profile using gas chromatography. All ewes were at second lactation and were fed under the same conditions without any differences in nutrition or management. Results revealed that lactation stage affected fatty acid profile significantly. Specifically, saturated fatty acids (SFA) concentration was found to be lower at the end of the lactation (1<sup>st</sup> sampling vs 6<sup>th</sup> sampling: 70 vs 68%,  $P\leq 0.05$ ), while monounsaturated fatty acids (MUFA), polyunsaturated fatty acids (PUFA) and conjugated linoleic acid (CLA) concentrations were higher at the end (24 vs 26%, 4.70 vs 4.79% and 1.23 vs 1.65%, respectively,  $P\leq 0.05$ ). Regarding the correlations of grouped fatty acids, a negative one was found between undesirable fatty acids, such as SFA, and beneficial fatty acids for consumer health [unsaturated fatty acids (UFA) (-0.45), PUFA (-0.40), respectively]. Moreover, the results of the study showed that the coefficient of variation (CV%) in most fatty acids was high (>40%), indicating that desired characteristics can be identified and selected for, in Chios sheep. In conclusion, different stages of lactation result in a variable nutritional value, affecting the optimal FA profile of dairy products. Additionally, incorporating milk fatty acid profiling into the sheep selection index, can be an innovative and useful tool in animal selection. The study was funded by the Research Committee of the Aristotle University of Thessaloniki.

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Date: Tuesday 1 December 2020; 13.45 – 17.30

Chair: Tzamaloukas / Keane

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# Book of Abstracts of the 71<sup>st</sup> Annual Meeting of the European Federation of Animal Science



**Book of abstracts No. 26 (2020)**  
**Virtual Meeting**  
**1-4 December 2020**

# Book of Abstracts of the 71<sup>st</sup> Annual Meeting of the European Federation of Animal Science

Virtual Meeting, 1<sup>st</sup>–4<sup>th</sup> December, 2020



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## Effect of proanthocyanidins of sainfoin on secondary compounds in milk and suckling lamb meat

sainfoin (*Onobrychis viciifolia*)

Aim: evaluate if the proanthocyanidins of sainfoin contribute to the presence of secondary compounds in the milk of the ewe increasing the contents in the meat of the suckling lamb



M. Blanco, C. Baila, M. Joy, J.R. Bertolín, I. Casasús, S. Lobón



### Material and Methods

20 pairs of Rasa Aragonesa ewes and their suckling ♂ lambs

Ewes' diet:

Fresh sainfoin *ad libitum*  
+ 200 g/d barley



+ Oral dose twice/daily → Water (Sainfoin)  
→ PEG (Sainfoin+PEG)  
(50 g PEG 4000/100 ml water)



Suckling lambs: continuous access to their dams → slaughter: 11 kg LW

↳ Longissimus dorsi muscle

Controls: ewes' individual daily intake and milk production weekly during 4 weeks

Analyses: polyphenols, carotenoids & tocopherols

- Feedstuffs
- Milk
- Longissimus dorsi muscle

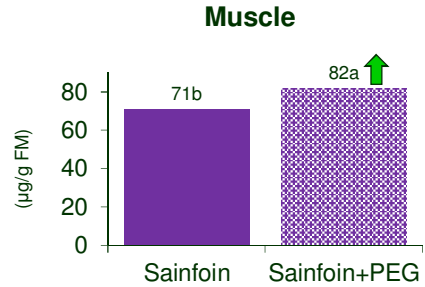
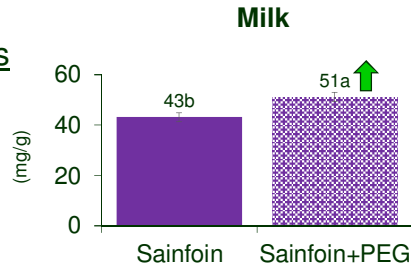
→ PEG, week & PEG × week  
→ PEG



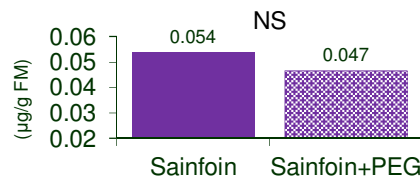
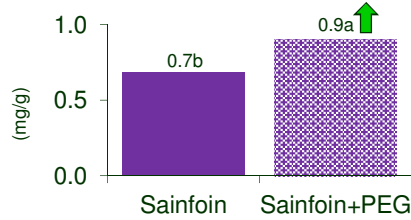
**Main results**

Ewes' intake of secondary compounds: NS

Polyphenols

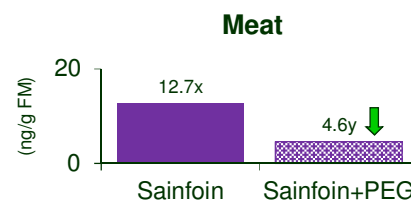
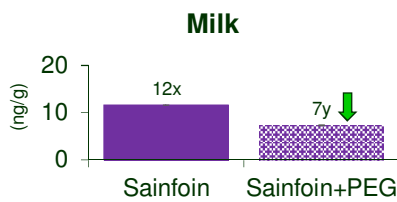


Retinol



(a,b P<0.05)

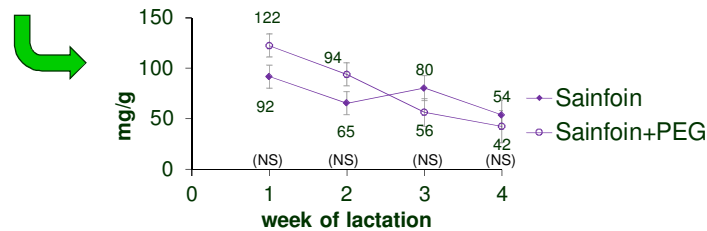
Lutein



(x,y P<0.10)

Tocopherols: no effect of PEG or week (milk)

γ-tocopherol: PEG inclusion x week: P < 0.01



(a,b P<0.05)

