

## Traceability of the ewe's diet using the fatty acids of the milk and the meat of the suckling lamb

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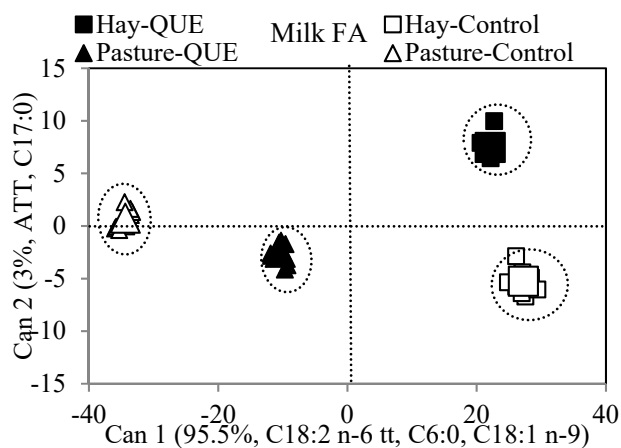
**Take home message** Milk fatty acids are useful to trace accurately ewe's diet.

**Introduction** There is growing interest in identifying strategies to enhance the concentration of healthy fatty acids (FA) in food (Chikwaha *et al.* 2017). Grazing is an advisable system to increase healthy FA in milk, and consequently in suckling lamb meat (Joy *et al.* 2012). Condensed tannins (CT) have also been used to modify the FA profile of ewe's milk and meat of the lambs (Carreño *et al.* 2015). Quebracho (*Schinopsis balanseeae*), which is rich in CT, can be included in the ewe's concentrate. Moreover, consumers demand guarantees of the feeding given to the animals. The aim of this study was to evaluate if the FA profile discriminated the type of forage and the inclusion of quebracho in the diet fed to ewes.

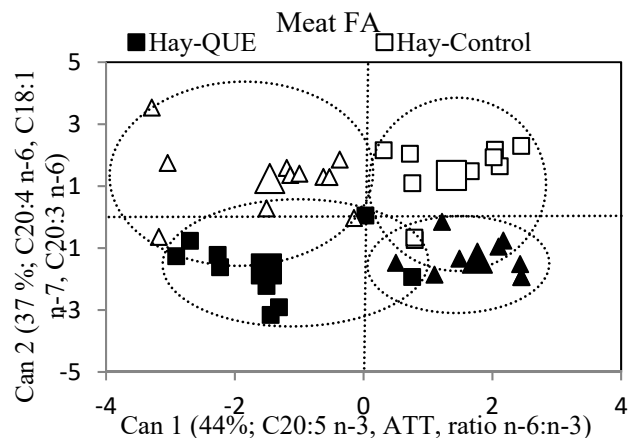
**Materials & methods** Thirty-nine ewe-lamb pairs were separated into 2 groups at lambing. One group grazed in mountain pastures (Pasture) and the other group was housed indoors and fed pasture hay (Hay). Within each type of forage, half of the ewes received 300 g/d of a commercial concentrate (Control), and the other half received 300 g/d of a concentrate containing 10% quebracho (QUE). Ewes were milked weekly and suckling lambs were slaughtered when they reached 10-12 kg of live weight. The FA profiles of milk and of the *Longissimus thoracis* muscle of the suckling lambs were analysed (Lobón *et al.* 2015). Fatty acid composition was used to classify individuals into the four feeding strategies (Pasture + QUE, Pasture + Control, Hay + QUE, Hay + Control) through canonical discriminant analyses using SAS V.9.3. Canonical correlations with a P-value lower than 0.05 were considered significant and thereby shown in the text.

**Results & discussion** The discriminant analysis of milk FA (Figure 1) accounted for 98.5% of the total variation between treatments and it was mainly determined by Can 1 including C18:2 n-6tt ( $r=-0.86$ ), C6:0 ( $r=-0.86$ ) and C18:1 n-9 ( $r=0.84$ ) and discriminated by the type of forage. Can 2 included ATT ( $r=-0.28$ ) and C17:0 ( $r=0.26$ ) and discriminated by the inclusion of quebracho in the concentrate. Meat FA discriminant analysis (Figure 2) accounted for 81% of the total variation. Can 1 included ATT ( $r=0.43$ ), ratio n-6:n-3 ( $r=0.43$ ) and C20:5 n-3 ( $r=-0.34$ ) as the main discriminator variables. Whereas, Can 2 included as main variables C20:3 n-6 ( $r=-0.36$ ), C20:4 n-6 ( $r=-0.27$ ) and C18:1 n-7 ( $r=-0.26$ ). All ewes were correctly classified using their milk FA profile, while some lambs were misclassified using the FA profile of the meat (10-18%).

**Figure 1** Canonical discriminant analysis between animal feeding based on fatty acid composition of milk.



**Figure 2** Canonical discriminant analysis between animal feeding based on fatty acid composition of lamb meat.



**Conclusion** Discriminant analyses were able to classify the different treatments studied according to their FA profiles. It was accurate with milk FA profile of the dam rather than with meat FA profile of the suckling lamb.

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