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Finishing effect on fatty acid profile of intramuscular fat in extensively reared steers

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Introduction Both the amount and the composition of fat depots in beef may be influenced by several factors i.e. feeding system. Related to this factor, extensively reared cattle may produce beef with a more desirable fatty acid (FA) composition in terms of beneficial effect on human health, especially in relation to the content of *n*-3 type FAs. However, concentrate finishing improves some carcass traits and meat quality. In this sense, the objective of this work was to study the effect of concentrate finishing on intramuscular (IM) FA profile of *Longissimus thoracis* (LT) muscle in pasture fed steers.

Materials and methods Eight yearling steers from “Asturiana de los Valles” were reared under extensive conditions on pasture. Four of them received a finishing diet (84% barley meal, 10% soya meal, 3% fat, 3% minerals, vitamins and oligoelements) during the last 60 days before slaughter. Average slaughter weight was 441 kg for animals fed with grass, and 504 kg for animals supplemented with concentrate. After 24h *post mortem* meat sample was vacuum packed and frozen at -80°C for subsequent FA analysis by GC using internal standard ($\text{C}_{23:0}$). The FAs were extracted and methylated by the modified method of Elmore *et al.* (1999). IM fat content (%) was determined by near infrared spectroscopy.

Results In comparison to animals fed with pasture, meat from animals finished with concentrate showed (Figure 1): 1) significantly higher quantities of $\text{C}_{18:1c11}$, $\text{C}_{18:3n-6}$ and $\text{C}_{20:2n-6}$; 2) significantly lower quantities of $\text{C}_{18:3n-3}$ and $\text{C}_{20:5n-3}$, while some *n*-6 type long chain FAs showed the same tendency ($\text{C}_{20:3n-6}$ & $\text{C}_{20:4n-6}$); 3) significantly higher *n*-6/*n*-3 and a tendency to a lower P/S ratio. The first two principal components explained 79% of the variation observed on FA composition (Figure 2). PC1 is positively related to SFAs, MUFAs, BFAs (individuals & groups), *c9t11*CLA, $\text{C}_{18:3n-6}$, $\text{C}_{20:2n-6}$ and total FAs, and negatively related to P/S ratio and in a lower degree with *n*-3 type of FAs. PC2 is positively related to $\text{C}_{18:3n-3}$, $\text{C}_{20:5n-3}$ and $\text{C}_{22:1c13}$, and negatively related to *n*-6/*n*-3 ratio.

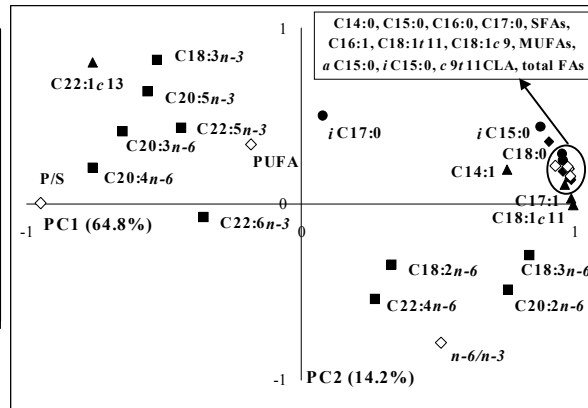
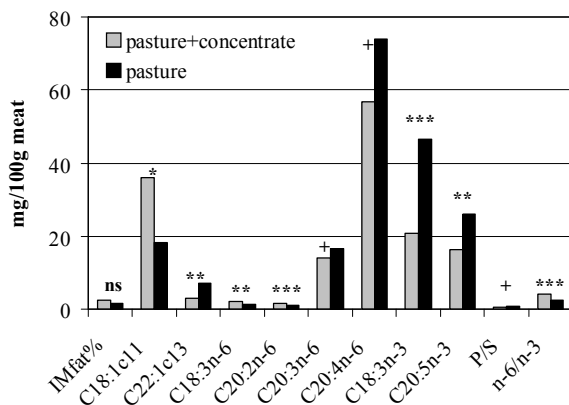


Figure 1 Finishing effect on IM fat%, FA quantities (only significantly different ones are represented, $p \leq 0.1$) and ratios

Figure 2 Biplot representation of principal components (PC1 & PC2) of different variables studied

Conclusions According to the FA profile, meat obtained from animals finished with concentrate had lower quantities of *n*-3 and higher quantities of *n*-6 type of FAs in comparison to animals fed only with pasture. However, in general, meat obtained from both production systems were well adapted to human nutritional requirements taking into account P/S and *n*-6/*n*-3 ratios.

References

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