Effect of lipid supplements on ruminal biohydrogenation intermediates and muscle fatty acids in lambs

The objective was to characterize the fatty acid (FA) composition of lamb meat with emphasis on biohydrogenation intermediates (BI) induced by dietary sunflower and linseed oil and to test if a synergistic effect on meat trans-11 18:1 and cis-9,trans-11 18:2 concentrations could be obtained with a blend of both oils. Thirty two lambs were assigned to four groups and fed for 6 weeks one of the following diets: pelleted dehydrated lucerne (Control); and Control supplemented with 7.4% of sunflower oil (SF), linseed oil (LS) or a blend of sunflower and linseed oils (2:1, v/v, v/v) (SFLS). Longissimus thoracis muscles were analyzed for FA. LS increased n-3 PUFA due to contribution of 18:3n-3 but not of very long n-3 PUFA. Total conjugated linoleic acids were similar in oil-supplemented lambs, but the cis-9,trans-11 18:2 was higher with SF than with LS. No synergistic effects on trans-11 18:1 or cis-9,trans-11 18:2 were observed when both oils were fed together. Oil supplementation increased the concentrations of most BI in meat. However, the BI patterns were different for LS and SF. Some FA were only found in lambs fed linseed oil, including the unusual cis-12,cis-15 18:2 which is proposed as a new intermediate of the 18:3n-3 biohydrogenation pathway.

Keywords: Lamb, fatty acid, linseed oil, sunflower oil, rumen biohydrogenation.