Distribution of C_{18} Fatty Acids between Polar and Neutral Lipids of Lambs fed with Graded Levels of Sunflower and Linseed oils.

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The effect of dietary replacement of sunflower oil (SO) with linseed oil (LO) on C_{18} fatty acids (FA) composition in intramuscular polar (PL) and neutral (NL) lipids of lambs was evaluated. Thirty-six Merino Branco ram lambs were divided into 4 groups and submitted one of 4 diets: dehydrated lucerne plus 6% of SO; dehydrated lucerne plus 4% of SO and 2% of LO; dehydrated lucerne plus 2% of SO and 4% of LO and dehydrated lucerne plus 6% of LO. Lambs were slaughtered after 7 weeks of trial. Total lipids were separated in Neutral (NL) and Polar (PL) lipids. Fatty acids methyl esters were prepared and analyzed by gas chromatography using a 100m CP-Sil 88 capillary column and methyl esters of conjugated linoleic acids (CLA) were analyzed by triple column silver-ion in series, using an HPLC system. The dietary replacement of SO with LO affected the pattern of C_{18} FA both in PL and NL fractions. In PL, the dietary replacement of SO with LO led to an extensive substitution of 18:2*n*-6 with 18:3*n*-3 and 18:1*cis*-9, suggesting a regulatory mechanism, to maintain the degree of unsaturation of C_{18} FA in membrane lipids fairly constant. Dietary LO increased the diversity of C_{18} FA; increasing strongly some C_{18} FA, as 18:2*trans*-11,*cis*-15, and some C_{18} FA were only found in lambs fed LO, including 18:2*cis*-12,*cis*-15, 18:3*cis*-9,*trans*-13,*cis*-15 and 18:3*cis*-9,*trans*-11,*cis*-15. Most *trans* C_{18} FA were preferentially incorporated in NL fraction, but the 18:2*n*-6, 18:3*n*-3 and some putative rumen biohydrogenation intermediates (BI) like 18:1*cis*-11, 18:1*cis*-12, 18:1*cis*-15, 18:2*cis*-9,*cis*-15, 18:2*cis*-12,*cis*-15 and 18:2*cis*-11,*trans*-13 were preferentially incorporated in PL. Most of *trans* BI, including CLA isomers were preferentially deposited in NL of muscle, suggesting that their potential for competitive interactions with elongation and desaturation metabolic pathways of essential FA are low.