Effect of Linseed Oil Dietary Supplementation on Fatty Acid Composition and Gene Expression in Adipose Tissue of Growing Goats

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Abstract: This study was conducted to determine the effects of feeding oil palm frond silage based diets with added linseed oil(LO)containing high α-linolenic acid(C18:3n-3), namely, high LO (HLO), low LO(LLO), and without LO as the control group (CON) on the fatty acid(FA) composition of subcutaneous adipose tissue and the gene expression of peroxisome proliferator-activated receptor(PPAR)α, PPAR-γ, and steatoyl-CoA desaturase(SCD) in Boer goats. The proportion of C18: 3n-3 in subcutaneous adipose tissue was increased ($P<0.01$) by increasing the LO in the diet, suggesting that the FA from HLO might have escaped ruminal biohydrogenation. Animals fed HLO diets had lower proportions of C18:1 trans-11, C18: 2n-6, CLA cis-9 trans-11, and C20: 4n-6 and higher proportions of C18: 3n-3, C22: 5n-3, and C22: 6n-3 in the subcutaneous adipose tissue than animals fed the CON diets, resulting in a decreased n-6:n-3 fatty acid ratio(FAR)in the tissue. In addition, feeding the HLO diet upregulated the expression of PPAR-γ($P<0.05$) but downregulated the expression of SCD ($P<0.05$) in the adipose tissue. The results of the present study show that LO can be safety incorporated in the diets of goats to enrich goat meat with potential health beneficial FA(i.e., n-3 FA).