

## **Effect of linseed oil dietary supplementation on fatty acid composition and gene expression in adipose tissue of growing goats**

### **ABSTRACT**

This study was conducted to determine the effects of feeding oil palm frond silage based diets with added linseed oil (LO) containing high  $\alpha$ -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) $\alpha$ , PPAR- $\gamma$ , and stearoyl-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- $\gamma$  ( $P < 0.05$ ) but downregulated the expression of SCD ( $P < 0.05$ ) in the adipose tissue. The results of the present study show that LO can be safely incorporated in the diets of goats to enrich goat meat with potential health beneficial FA (i.e., n-3 FA).

**Keyword:** Fatty acids; Goat; Gene expression; Linseed oil dietary; Adipose tissue