

## **Effect of feeding palm oil by-products based diets on total bacteria, cellulolytic bacteria and methanogenic archaea in the rumen of goats**

### **ABSTRACT**

Rumen microorganisms are responsible for digestion and utilization of dietary feeds by host ruminants. Unconventional feed resources could be used as alternatives in tropical areas where feed resources are insufficient in terms of quality and quantity. The objective of the present experiment was to evaluate the effect of diets based on palm oil (PO), decanter cake (DC) or palm kernel cake (PKC) on rumen total bacteria, selected cellulolytic bacteria, and methanogenic archaea. Four diets: control diet (CD), decanter cake diet (DCD), palm kernel cake diet (PKCD) and CD plus 5% PO diet (CPOD) were fed to rumen cannulated goats and rumen samples were collected at the start of the experimental diets (day 0) and on days 4, 6, 8, 12, 18, 24 and 30 post dietary treatments. Feeding DCD and PKCD resulted in significantly higher ( $P<0.05$ ) DNA copy number of total bacteria, *Fibrobacter succinogenes*, *Ruminococcus flavefeciens*, and *Ruminococcus albus*. Rumen methanogenic archaea was significantly lower ( $P<0.05$ ) in goats fed PKCD and CPOD and the trend showed a severe reduction on days 4 and 6 post experimental diets. In conclusion, results indicated that feeding DCD and PKC increased the populations of cellulolytic bacteria and decreased the density of methanogenic archaea in the rumen of goats.

**Keyword:** Rumen; Control diet (CD); Decanter cake diet (DCD); Palm kernel cake diet (PKCD); CD plus 5% PO diet (CPOD); Diets based on palm oil (PO)