Effects of supplementation of *Eucalyptus globulus*essential oil on methane production, dry matter intake and milk composition in Jersey cows

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Application: Improving dairy cow performance with supplemental eucalyptus oil can be a novel strategy in dairy cow nutrition and will contribute to the sustainability of the eucalyptus oil extraction enterprise.

Introduction: Essential oil have a wide range of applications including antimicrobial properties, reduction in methane emission by ruminants as well as improvements to growth, milk production, and feed efficiency making them a useful replacement to in-feed antibiotics and growth promoters(Hallier et al., 2013). The aim of the study was to investigate the effects of supplementation with *Eucalyptus globulus* oil on dry matter intake, milk yield and methane production in dairy cows.

Materials and methods: Eight primiparous Jersey cows (140 ± 14 Days in milk) in a zero grazing system were used in a four replicated 2 X 2 Latin square design. The animals had 21 days of adaptation and 7 days for measurements. The treatments were: 1) control and 2) dosing with 15 g d^{-1}Eucalyptus globulus, oil. Cows in both groups received 6 kg d^{-1} of a dairy concentrate, had free access to *Eragrostis curvula* hay and clean water. Milk yield was recorded daily and milk composition determined. Methane production was measured as concentration part per million using a laser methane detector during 7 days of data collection. Measurements was performed twice a day, morning and afternoon. Data were analysed according to a 2 x 2 Latin square design using the general linear model procedures of the statistical analysis systems, 2009 for the average effects over time.

Results: There were no significance difference observed in dry matter intake, milk yield and milk protein concentration ($p>0.05$). However, there wasa significant increase and decrease decline in milk fat % and protein % ($p=0.04$). Methane production (mg/kg) tended ($P=0.06$) to be lower in cows supplemented with essential oil than control cows.

Conclusion: Dosingmid-lactating primiparous Jersey cows with *Eucalyptus globulus* did not affect dry matter intake and milk yield but the milk fat content was increased.The reduced methane might have not spared sufficient energy that could enhance milk production. A prolonged feeding trial is recommended during early lactating to better understand the influence of supplementation of the oil.