

## Feeding oregano and green tea extracts to dairy cows affects blood profile and oxidative status

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Plant secondary compounds may improve health of domestic animals due to their antioxidant and anti-inflammatory activities. This trial had the objective to evaluate the effects of adding oregano extract (*Origanum vulgare*), green tea (*Camellia sinensis*) and their combination into the diet fed to lactating dairy cows on blood profile and enzymes of oxidative stress. Sixteen Holstein cows and 16 Holstein and Gir crossbred cows aged of  $5.4 \pm 2.3$  years, weighing  $533 \pm 81.63$  kg, with  $58 \pm 20$  days in milk and  $2.5 \pm 1.6$  lactations were blocked by genetic group and randomly assigned to four treatments (groups) as follows: CO = control without herbal extracts, OE = with daily addition of 10 g of oregano extract, GT = with daily addition of 5.0 g of green tea extract and MIX = with daily addition of 10 g of OE plus 5 g of GT. Cows were housed in a free-stall barn, split in four pens (one for each treatment) and individually fed for 58 days. Measurements were performed on days 14, 35 and 58. Data was analyzed according to a randomized block design with repeated measures (days), testing the effect of breed, treatment, days and interaction between treatment and days. Measurements done on day 1 (before the inclusion of the plant extracts into the diet) were used as covariates. The effects on blood profile and antioxidant status varied between treatments but a synergic effect was perceived for oxidation of dichlorofluorescein in erythrocytes. Groups C ( $4,091 \pm 550 \mu\text{L}^{-1}$ ), OE ( $4,962 \pm 471 \mu\text{L}^{-1}$ ) and MIX ( $4,247 \pm 539 \mu\text{L}^{-1}$ ) presented higher segmented neutrophils compared to GT group ( $2,970 \pm 431 \mu\text{L}^{-1}$ ). MIX ( $601 \pm 74 \mu\text{L}^{-1}$ ) and C ( $612 \pm 72 \mu\text{L}^{-1}$ ) groups showed higher eosinophils values compared with OE ( $266 \pm 63 \mu\text{L}^{-1}$ ). Cows fed MIX showed lower values for oxidation of dichlorofluorescein in erythrocytes ( $7,536 \pm 473 \text{ nmol mg}^{-1}$ ) than for C ( $9,007 \pm 470 \text{ nmol mg}^{-1}$ ), OE ( $9,510 \pm 475 \text{ nmol mg}^{-1}$ ) and GT ( $8,975 \pm 472 \text{ nmol mg}^{-1}$ ). Cows fed GT presented higher levels of reduced glutathione ( $1.3 \pm 0.2 \text{ U mg}^{-1}$ ) than when fed with C ( $0.9 \pm 0.2 \text{ U mg}^{-1}$ ), OE ( $0.7 \pm 0.2 \text{ U mg}^{-1}$ ) and MIX ( $0.9 \pm 0.2 \text{ U mg}^{-1}$ ). Cows fed OE presented higher values for catalase ( $1.3 \pm 0.1 \text{ U mg}^{-1}$ ) than cows fed C ( $1.1 \pm 0.1 \text{ U mg}^{-1}$ ), GT ( $1.1 \pm 0.1 \text{ U mg}^{-1}$ ) and MIX ( $1.1 \pm 0.1 \text{ U mg}^{-1}$ ). Inclusion of plant extracts into the diet changes blood profile and antioxidant status.

Keywords: antioxidant status, blood profile, health, plant extracts

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