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# In-field efficacy of oregano oil administration on the control of neonatal diarrhea syndrome in calves

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## Introduction

Oregano essential oil has strong antibacterial activity against gram negative bacteria and especially *E. coli*<sup>1</sup>. Apart from its antibacterial properties, it was also found to have antiviral<sup>2</sup> and anticryptosporidial<sup>3</sup> effects in vitro. Based on these properties it could be hypothesized that the administration of oregano essential oil in newborn calves might have beneficial effects in treating and preventing diarrhea syndrome. The objective of this study was to evaluate under field conditions, whether daily administration of oregano essential oil is effective in preventing and/or diminishing the severity of neonatal diarrhea syndrome in calves aged less than 15 days.

## Material and Methods

Ninety-one newborn calves from three dairy farms (31 from Farm 1, 30 from Farm 2 and 30 from Farm 3) were assigned into two groups; Eco group (n=46) calves were orally drenched with oregano essential oil (ECODIAR<sup>®</sup> liquid 5%) at the dose of 12.5 mg/kg body weight once per day until the age of 10 days. Conts group (n=45) calves were left untreated and served as controls. The experiment lasted 15 days for each calf. Feces were scored every day throughout the experiment after the morning feeding using a three point scale (1=normal, 2=intermediate, 3=watery). Calves with fecal scores  $\geq 2$  were considered diarrheic. Fecal samples were collected on days 3, 6 and 10 for virological, bacteriological and parasitological evaluation. The health status of all calves was routinely monitored and in cases of diarrhea the animals were treated with electrolytes per os, intravenous fluids and antibiotics if needed. The data was analyzed with Chi-square and Univariate ANOVA tests (SPSS<sup>®</sup> 21) and Kaplan-Meier survival analysis was run to estimate the recovery rate among groups (MedCalc<sup>®</sup> 9.2).

## Results and Discussion

Diarrhea was observed at 71 out of 91 calves used in the experiment. The incidence of diarrhea was significantly lower in Eco group compared to Conts (69.6% vs 91.1%;  $P < 0.05$ ). The majority of diarrhea cases was due to mixed infections with rotavirus and *Cryptosporidium* spp, (>53%) followed by rotavirus (>23%) in both experimental groups. Average fecal score throughout the experiment, number of days with diarrhea and severity of diarrhea episodes were significantly lower in Eco group than the Conts ( $P < 0.05$ ). The percentage of calves needed treatment was also significantly lower ( $P < 0.05$ ) in Eco group (28.1%) than the controls (65.9%). Survival analysis revealed that the median time until recovery was significantly lower ( $P < 0.05$ ) in Eco group (3 days) compared to the controls (5 days). These effects could be attributed to the inhibition of coliform bacterial overgrowth in the small intestine of diarrheic calves by oregano essential oil due to its strong antibacterial activity against *E. coli*<sup>1</sup>.

## Conclusions

Daily administration of oregano essential oil in calves for the first 10 days of their life effectively diminishes the severity of naturally acquired diarrhea under field conditions and, under certain hygiene practices, possess a preventive effect against neonatal diarrhea syndrome.

## References

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## Keywords

Oregano essential oil; calves; diarrhea; treatment; prevention.