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# ABSTRACT BOOK

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Viasoft Experience

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effectiveness in controlling haemonchosis in small ruminants.

**Impact of an ozone therapy protocol on the analytical values of dogs with leishmaniasis**

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Canine leishmaniasis (CanL) is a worldwide zoonosis of increasing prevalence. To date, no cure has been found for this pathology and studies into its prevention and treatment are constantly being updated. The development of resistance to current treatments and the increase in the prevalence of the disease make it necessary to research new therapeutic approaches. As a chronic disease, leishmaniasis creates situations of oxidative stress in the body. Research into the effectiveness of ozone therapy in diseases caused by protozoa, such as canine leishmaniasis, is still recent and scarce, but that which is available reports improvements in clinical signs because it recovers immunomodulatory, antioxidant and healing activities in those infected. The present study analysed oxidative stress levels and the effect of oral supplementation with ozonated oil capsules (OXYYO3®) once a day for 30 days in animals infected with CanL. The study aimed to evaluate the impact of an ozone therapy protocol on oxidative stress and other physiological parameters in dogs diagnosed with CanL. Laboratory blood test, count, biochemistry and oxidative stress evaluation (d-ROMs, PAT and OSI redox) were performed after administration of ozonated oil capsules (OXYYO3®) once daily for a period of 30 days. Statistical analysis of the study, using one-way ANOVA tests, showed improvements in neutrophil (p=0.0491), globulin (p=0.0329) and albumin (p=0.0076) parameters in animals suffering from CanL. These results reinforce the potential of ozone therapy to modulate the immune response. These findings are consistent with the hypothesis that ozone therapy may exert beneficial effects through its antioxidant properties. By reducing oxidative stress, ozone therapy may help mitigate some of the detrimental effects associated with CanL, leading to an overall improvement in the health status of the affected animals.

***Ex vivo* and *in vivo* pharmacological interaction between antiparasitic drugs and the phytochemical monoterpenes thymol and cinnamaldehyde**

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Considering the increase of nematode resistance to the synthetic anthelmintic drugs, new control strategies are urgently needed. While many phytochemical compounds show *in vitro* antiparasitic activity, their *in vivo* therapeutic potential remains underexplored. Both the *ex vivo* and *in vivo* effects of cinnamaldehyde (CNM) and thymol (TML) on the doramectin

(DRM) and levamisole (LVM) nematodicidal response were assessed in naturally infected lambs. The interaction on intestinal absorption/secretion by CNM, TML (1.5 mM) DRM and LVM (5 µM) was assessed using a diffusion-chamber model with Rho123 (0.5 µM) as a substrate across lamb ileum tissue. Two *in vivo* trials (T1 and T2) examined the interactions between monoterpenes and the synthetic anthelmintics. In T1, CNM (100 mg/kg, orally at 0 and 24 h) was combined with DRM (0.2 mg/kg, SC), with outcomes evaluated over two years. In T2, lambs received LVM (3.75 mg/kg, SC) alone or combined with CNM or TML (80 mg/kg, SC at 0 and 3 h). Drug plasma levels were measured by HPLC and fecal egg count reduction (FECR) were used to assess efficacy. CNM and LVM decreased Rho123 efflux across lamb intestine, suggesting a drug transport-related interaction. In T1, co-administration with CNM increased DRM efficacy from 66.3% to 78.0% (first treatment year); however, no significant differences in efficacy or pharmacokinetic (PK) parameters were observed in the second year between the DRM and DRM+CNM groups. In T2, both CNM and TML enhanced LVM systemic exposure, increasing the area under the curve (AUC) by 20–50%. Despite this PK interaction, treatment efficacy remained comparable for LVM+CNM (55.5%), LVM+TML (57.8%) and LVM alone (51.4%). These results suggest that the phytochemicals CNM and TML may induce drug PK and/or pharmacodynamics interactions both *ex-vivo* and *in-vivo*. Overall, the findings offer valuable insights into the potential of phytochemicals as antiparasitic agents and on their interactions with conventional anthelmintics.

**Effects of zinc oxide nanoparticle supplementation on performance and immune response in sheep naturally infected with gastrointestinal nematodes**

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Gastrointestinal nematodes (GIN), particularly *Haemonchus contortus*, significantly impact sheep production. Zinc oxide nanoparticles (ZnO-NP) have demonstrated the potential to modulate immune responses against parasites. This study aimed to evaluate the effects of ZnO-NP supplementation (150 mg/day) on weight gain, hematological parameters, and immune response in sheep naturally infected with GIN. Twenty-seven sheep were divided into a Supplemented Group (n=14, 4 Santa Inês and 10 Ile de France) treated daily with 150 mg of ZnO-NP, supplied in individual capsules, and a Control Group (n=13, 4 Santa Inês and 9 Ile de France) without supplementation. Both groups grazed together on the same pasture and received concentrate (1.5% of body weight/day) and mineral supplements without Zn. Over 126 days, we monitored body weight, fecal egg count (FEC), packed cell volume (PCV), total plasma protein (TPP), eosinophil count and IgG levels. FEC remained low in Santa Ines sheep throughout the experiment (maximum 400 EPG in controls on day 56). Ile de France lambs showed peak FEC on day 56 (5,190 EPG in supplemented vs. 5,578 EPG in controls), with no significant effect of treatment on FEC ($P>0.05$). During peak in-