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Failure of long-acting ivermectin formulation to control Psoroptic mange infection in grazing beef cattle

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Abstract

The current work assessed the relationship between pharmacokinetic behavior and clinical efficacy of the classic ivermectin (IVM) formulation (1%) and the long-acting ivermectin (IVM-LA) formulation (3.15%) to cattle. The study was carried out on a commercial beef cattle farm with a grazing system of meat production. Twenty (20) calves with active mange infection were allocated into 2 groups (n=10) and treated with a single subcutaneous injection of either IVM (1%) at 0.2 mg/kg or IVM-LA (3.15%) at 0.63 mg/kg. The animals were weighed on a calibrated weighing scale to determine the dose prior to treatment. Blood samples were collected from 8 animals of each group to measure IVM concentrations by HPLC. Skin scraping samples were collected from each animal and mites were counted at 14, 21 and 28 days post-treatment. IVM-LA administration increased the systemic drug exposure compared to the classic IVM formulation ($p<0.05$). However, both formulations failed to achieve a clinical mange cure. While the classic IVM formulation obtained an acaricide efficacy of 0%, IVM-LA achieved an efficacy of 25% at day 14 post-treatment. The IVM-LA treatment reached the higher acaricide efficacy (38%) at 21 days post-treatment. The non-cured animals remained with active mange 28 days post-treatment. No differences ($p>0.05$) in the *Psoroptic ovis* scores density were observed after both formulations of IVM. Considering the reduction in mite counts is reported to be a suitable parameter to monitor acaricide resistance, the results of the present trial have shown the presence of *P. ovis* populations with reduced susceptibility to IVM. However, additional studies are needed both to confirm the resistance status and to optimize the control of psoroptic mange in cattle in the new acaricide resistance scenario.