Pharmacological strategies and influence of initial mite load for controlling psoroptic mange in grazing beef cattle

Canton, C.; Moriones, L.; Dominguez, P.; Lanusse, C.; Alvarez, L.; Lifschitz, A.
ccanton@vet.unicen.edu.ar - Laboratorio de Farmacología, Centro de Investigación Veterinaria de Tandil (CIVETAN), UNCPBA-CICPBA-CONICET, Facultad de Ciencias Veterinarias, Campus Universitario, (7000) Tandil, Argentina.

Psoroptic mange causes relevant losses of productivity in cattle. Therefore, bovine mange control is necessary to ensure adequate production levels on beef cattle farms. Macrocyclic lactones are one of the main pharmacological tools recommended for controlling it. Considering that field reports on failures of ivermectin and doramectin (DRM) in the treatment of cattle mange have increased in recent years in some regions like Argentina, the aim of the current work was to evaluate the effectiveness of DRM following their administration as traditional or long-acting formulations in combination with an ancillary therapy of cypermethrin + chlorpyrifos to cattle naturally infested by *P. ovis*. Additionally, the relationship between the mite load and the effectiveness of the treatment was evaluated. The study was carried out on five (5) commercial beef cattle farms with a grazing system of meat production. On farms A and B ten (10) calves with active mange infection were treated with a single subcutaneous (SC) injection of DRM (1%) at 0.2 mg/kg. On farms C, D, and E, ten (10) calves with active mange infection were treated with a single SC injection of DRM-LA (3.15% or 3.5%) at 0.63 or 0.7 mg/kg. On all the farms, a pour-on treatment combining cypermethrin (500 mg/animal) and chlorpyrifos (250 mg /animal) was administered concurrently with the injectable treatment as ancillary therapy. The animals were weighed on a calibrated weighing scale to determine the dose prior to treatment. Skin scraping samples were collected from each animal and mites were counted at 14 and 21 days post-treatment on farms A and B; and 21 days post-treatment on farms C, D and E. Correlation between initial and post-treatment mite counts was performed by parametric analysis (Pearson's r), and the number of negative and positive animals obtained after the different treatments were compared with the Fisher exact test. While the average mite count was 50 on farm A, it was 150 on farm B. DRM 1% + pour-on failed to achieve a 100% efficacy at day 14 on both farms. However, this classic DRM formulation + cypermethrin-chlorpyrifos obtained an acaricide efficacy of 100% at day 21 post-treatment on farm A (low initial mite count). The average mite counts on farms C, D and E were 126, 138 and 41, respectively. While the acaricide efficacies were 85% and 94% on farms C and D, DRM-LA + cypermethrin-chlorpyrifos pour-on treatment reached a 100% acaricide efficacy on farm E (low initial mite count). A positive correlation between initial and post-treatment mite counts were found (r 0.498, $p<0.0001$). In fact, a higher percentage of negative animals was observed in those with lower initial counts ($p<0.0001$). In conclusion, depending on the mite load the use of DRM in combination with an ancillary therapy of cypermethrin and chlorpyrifos can be useful to control Psoroptic mange in cattle. It is now crucial to accomplish adequate management of this disease and optimize mange control through early diagnosis and treatment strategies implemented on an individual cattle farm basis.