

24.08.23

Breakout 3: OA29 Parasite Control

OA29.01

Pharmacokinetic and field efficacy evaluations of combined anthelmintic treatments to optimize control of resistant nematodes in cattle_ Dr. Candela Canton_CIVETAN, Argentina

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A pharmaco-parasitological assessment of two different nematocidal combinations of a macrocyclic lactone and a benzimidazole anthelmintic were performed in 3 cattle farms with a multi-resistant field scenario (A and B in Argentina and C in New Zealand). Ivermectin (IVM) + ricobendazole (RBZ) both given subcutaneously and abamectin (ABA)+oxfendazole (OXF) both given orally were assessed in calves infected with gastrointestinal nematodes resistant to both chemical families. No adverse pharmacokinetic (PK) interactions were observed after each combined treatment, with no differences in PK parameters ($P>0.05$) observed between the single-drug and the combined-based strategies. The initial efficacies were 40% (IVM), 64% (RBZ) and 90% (IVM+RBZ) (Farm A), and 54% (IVM), 84% (RBZ) and 98% (IVM-RBZ) (Farm B). After repeated annual use (over 5 years) of the same combination on both farms, the efficacy of the combined treatment decreased to 83% and 93% on Farm A and B, respectively. To optimize drug activity against those highly bi-resistant nematode populations, oral combined treatments were assayed. On Farm C, the *Cooperia* spp. were resistant to OXF, and the *Ostertagia* spp. were resistant to both ABA and OXF. In this context, the combined treatment only achieved an 84% efficacy against *Ostertagia* spp. The presence of multiple resistant *Ostertagia* spp. determined a reduced efficacy of the combined treatment. In contrast, on Farms A and B the *Ostertagia* spp. were only resistant to OXF and both anthelmintics failed to control *Cooperia* spp. Under this scenario, the combination was the only treatment that achieved 97-100% efficacy against all genera, indicating an additive effect. Overall, anthelmintic combinations can be useful to optimize the control of resistant gastrointestinal nematodes of cattle. However, its rational use should be strongly supported by pre-treatment diagnosis and considering the epidemiological situation of each individual farm especially the importance of refugia in maintaining effectiveness of the combinations

OA29.02

Albendazole resistance in *Fasciola hepatica*: surveillance in different areas of Spain and Argentine_ Alvarez, Prof. Luis_CIVETAN

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Triclabendazole is the worldwide most used compound to control *Fasciola hepatica* and reports on drug resistance are abundant. parasite. Although the flukicidal use of albendazole (ABZ) is not as widespread, ABZ-resistance reports in liver flukes have increased in recent years. The work reported here describes a survey of the susceptibility/resistant status of different *F. hepatica* isolates to ABZ in two geographic regions of Spain and Argentina, using the egg hatch test (EHT). *F. hepatica* eggs were obtained from the gall bladder or faeces of natural infected cattle or

sheep from different geographical areas of northern Spain (Castilla y León, Galicia and Asturias) and east (Litoral) and south (Patagonia) of Argentine. Fluke eggs were incubated at 25 °C in darkness for a 12 h period with ABZ (0.5 nmol/mL). Untreated eggs served as control. After incubation, all eggs were gently washed to facilitate drug removal, and kept in darkness at 25 °C for 15 days. After this period, eggs were exposed to light for 2 h to stimulate the hatching of miracidia. Hatched and unhatched (undeveloped) eggs were evaluated using an optical microscope and the ovicidal activity, expressed as a percentage, was calculated. A total of 42 (Spain) and 28 (Argentine) *F. hepatica* isolates were assessed for ABZ-resistance. After the EHT, 4 (9%) isolates from Spain results ABZ-resistant. The EHT could be successfully performed in 28 Argentinian isolates, resulting 75% of them resistant to ABZ. The high prevalence of ABZ-resistance in *F. hepatica* observed in Argentina can be explained by the widespread use of this flukicidal drug instead of triclabendazole. Oppositely, the low ABZ-resistance observed in the isolates collected from Spain may be related to the common use of a variety of alternative flukicidal drugs, such as closantel, nitroxynil and/or clorsulon.

OA29.03

Building a community for sustainable management of livestock tick control and acaricide resistance mitigation_Lempereur, Dr. Laetitia_Fao

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A community of practice on acaricide resistance management of livestock ticks was recently created which now has over 300 members across sectors, disciplines and geographical areas. This community welcomes members to learn from each other, co-create new knowledge, and tap into the practical experience of a large community of practice for the advancement of the sustainable management of livestock tick control and acaricide resistance mitigation. This community is logistically supported by a virtual platform (<https://virtual-learning-center.fao.org/mod/page/view.php?id=7392>) for information exchange, resource consultation, dialogue between its members or seminar organization. The creation of this community is currently enabling the development of new guidelines on sustainable management of livestock tick control and acaricide resistance mitigation at global level. These guidelines cover various complementary themes such as, diagnostic of acaricide resistance, integrated ticks and acaricide resistance management, regulation and access to acaricide products, research and innovation and communication and implementation, for which guidance is provided notably via recommendations, decision tree etc., with the ultimate aim of supporting the development and implementation of intervention programs or concrete actions by the various stakeholders. Building a global community on complex issues such as tick control requires the effort to be open to diversity and cooperation as implied by the one health approach. Although, it's well outweighed by the benefits of creating opportunities for commonly agreed strategy which will be carried by a broad community to ensure its acceptance, communication and implementation.