

22.08.23

Breakout 3: OA17 Parasite vaccines

OA17.01

Interactions between gut microbiome and nematode parasites in sheep_Lanusse, Dr. Carlos_Conicet, Argentina

Co-Authors - Matias Faraco, Prof. Dr. Ignacio Alvarez, Dr. Mercedes Lloberas, Patricia Cardozo, Lucila Moriones, Paula Dominguez, Dr. Fernanda Imperiale, Dr. Juan Pedro Liron

Traditionally, research in host-helminthic interactions has focused on the host's immune system and the parasite. Over the last decade, the development of the next generation DNA sequencing tools allow us to add a third player, the host gut microbiome. The aim of the present work was to investigate in vivo, the interaction between sheep gastrointestinal (GI) parasites and the gut microbiome. In this line, we used 15 naturally infected sheep in order to explore how the nemabiome and gut microbiome compositions influenced each other before and after treatment with monepantel (MNP) and the broad-spectrum antibiotic oxytetracycline (OXT). We wait for microbiome stabilization and 17 days post treatment, abomasum and colon content and worm samples were taken. As we expected, adult parasites were not observed in the GI tract of the MNP treated animals, with the exception of *Oesophagostomum* in colon. High-throughput Illumina sequencing of the bacterial 16S rRNA V3-V4 region showed that the abomasum relative abundance of the methanogenic archaeobacteria and cyanobacteria changes in the MNP treated animals ($\log_2FC= 2.09$, $P_{adj}=0.045$; $\log_2FC=-1.39$, $P_{adj}=0.046$, respectively). No statistical differences between groups were observed in the colon bacteria content. OXT treatment did not affect the parasite content of the animal GI tract. To conclude, the results here presented showed that the lack of parasites or the direct effect of the MNP, impact in the microbial composition of the sheep abomasum, particularly in the Archaea content, rumen microorganisms that produce methane, a gas that has been implicated in global warming.

OA17.02

The development of an Australian *Tritrichomonas foetus* inactivated vaccine._Tabor, Prof. Alicja_The University Of Queensland

Co-Authors - Dr Gry Boe-Hansen, Prof Michael McGowan, Dr Kieren McCosker, Mr Tony Cavallaro

In North Australian extensively grazed beef herds, losses from confirmed pregnancy to weaning are typically in the order of 5 to 15 percent and are estimated to cost the industry between \$60-\$AUD100 million a year. A recent abattoir survey undertaken across this northern industry indicated that one in 10 culled bulls were infected with *Tritrichomonas foetus* using qPCR. This prompted the development of an Australian strain as a new vaccine for trichomoniasis for development. After developing methods to grow pure cultures, establish viable storage conditions, and preliminary pilot trial was planned. Bulls were vaccinated with two doses one month apart and challenged preputially with live *T. foetus* parasites. A preliminary trial demonstrated 67% efficacy using old cull bulls. Future trials will employ younger bulls and challenge the bulls more frequently to mimic field challenge conditions. This research was supported by Meat & Livestock Australia and the Queensland Government.