2C-102: Strategies to quantitatively measure and reduce the load of Lawsonia in commercial herds

Project Leader: Dr Alison Collins

Project Participants: NSW DPI and Rivalea

Aims and Objectives:

1. Develop faecal sampling protocols for the reproducible quantification of Lawsonia load in commercial herds.
2. Determine the variability in Lawsonia load in the absence of significant management changes.
3. Correlate production measures with excretion of Lawsonia numbers to identify the critical threshold of Lawsonia that leads to production losses over a wide range of management systems.
4. Evaluate ileitis control strategies such as vaccination, improved hygiene and medication in a field trial.

Key Findings

1. Monitoring Lawsonia numbers by qPCR in pooled faecal samples is a reliable method to identify when herds are suffering from both clinical and sub-clinical ileitis.
2. The Lawsonia qPCR can be used to monitor the effect of management changes on ileitis control because in the absence of significant management changes, Lawsonia numbers do not vary over time and over consecutive batches of pigs.
3. Lawsonia numbers in faeces correlate negatively with ADG and feed intake, ie. higher Lawsonia numbers are detected in pigs with more severe production losses.
4. The critical threshold of Lawsonia that causes production losses in pigs on commercial farms was determined. ADG was reduced from 847 to 707g/day when excretion of Lawsonia increased from $10^7$ to $10^8 L. intracellularis$. However, production losses do occur in sub-clinchically affected pigs when they shed more than $10^6$ Lawsonia.
5. Vaccination against ileitis and disinfection of pens proved to be more effective at controlling ileitis and led to improved ADG and feed intake compared with olaquindox medication.

Application to Industry

1. New antemortem test to quantify the severity of ileitis in real time and determine if scouring or poor growth are caused by significant numbers of Lawsonia bacteria.
2. Pooled faecal samples collected from herds can be used to monitor Lawsonia load and ileitis control in the absence of significant management changes.
3. Pooled faecal samples and serology can be used to monitor the impact of management changes on ileitis control, immunity and especially the removal of antibiotics.
4. A new tool to evaluate alternative ileitis control strategies on farm, including dietary modifications (essential oils, organic acids, prebiotics and probiotics), hygiene and other treatments concurrent with vaccination.