2A-108: ***Evaluation of oral fluid samples for herd health monitoring of pathogens and the immune response in pigs***

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Aims and Objectives:

1) Develop capability and knowledge for the collection of oral fluid samples and determine storage and transport conditions needed for optimal quantitative PCR and ELISA performance under Australian conditions;
2) Determine if the currently recommended methods for oral fluid processing sufficiently reduce inhibitors that affect the ability of qPCR to detect pathogens;
3) Demonstrate that PCV2 (DNA and antibodies), Bungowannah virus (RNA) and *Lawsonia intracellularis* (antibodies and pathogen) can be detected in oral fluid samples;
4) Determine if the presence or quantity of pathogen or antibody detected in oral fluids correlates with that detected in serum and that this technique therefore has the potential for herd health monitoring of a range of both endemic and exotic diseases in the Australian pig population;
5) Make diagnostic testing for PCV2 and *Lawsonia intracellularis* using qPCR and serology, by means of oral fluid sampling/collection, available for Australian pig veterinarians and producers.

Key Findings:

- PCV2 and *Lawsonia intracellularis* DNA can be detected in oral fluid samples collected from the field.
- A commercially available PCV2 antibody ELISA kit was successfully adapted for the detection of PCV2 antibodies in oral fluid samples.
- A correlation was identified between oral fluid samples and the mean serum results for the PCV2 quantitative PCR and PCV2 antibody ELISA, and oral fluids could be utilised in the field for PCV2 and *L.intracellularis* surveillance.
- Oral fluid samples must be stored and transported at ≤4°C for optimal detection of nucleic acid and antibodies.
- Laboratory studies demonstrated that detection of Bungowannah virus RNA in oral fluids is possible.
- The inhibitory effect of oral fluid samples on the detection of nucleic acid appears to occur prior to the PCR step and results in a reduction in sensitivity.
- Oral fluids could also be used for monitoring *L.intracellularis* infection, as the qPCR on oral fluids correlated well with serum ELISA results. However, it was not possible to adapt Lawsonia serological assays for the oral fluid matrix. An improvement in test sensitivity without compromising test specificity is required.

Application to Industry:

This proof of concept project indicates that oral fluid testing should be a cost-effective means of herd health monitoring that has the potential to be used to detect a wide range of both viral and bacterial pathogens and associated antibody responses. The techniques and understanding developed as part of this project could lead to significant innovations in Australia in herd health monitoring, animal welfare and nutrition. The adoption of oral fluid sampling could be easily introduced at the farm level as collection kits are commercially available.

Before oral fluids can be used for disease surveillance (including emergency animal disease surveillance) by pathogen or antibody detection, the diagnostic tests will need to be validated.