Early Disease Detection in Effluent: Point of Management Tools for *E.coli* and APP

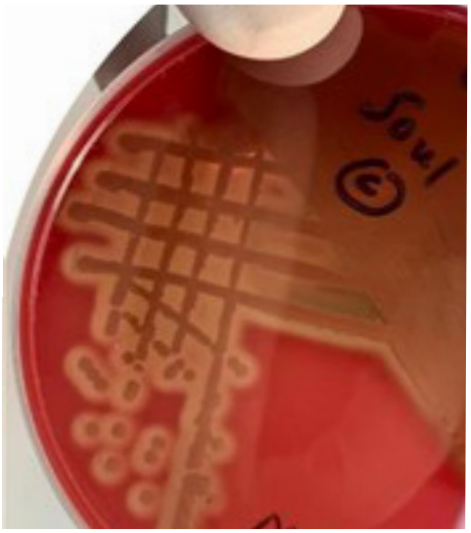
APL Project 2021/0013: Point of management tools for early detection of *Escherichia coli* and *Actinobacillus pleuropneumoniae* in effluent.

Project participants: University of Queensland

The problem

Piggery effluent can contain disease-causing bacteria, including enteric and respiratory bugs like *E.coli* and *Actinobacillus pleuropneumoniae* (APP). Being able to check effluent quickly on-farm could help spot disease risk earlier and support faster responses, improving outbreak control, reducing production losses, and protecting pig welfare.

Point of Management (POM) tools such as LAMP (loop-mediated isothermal amplification), offer a practical way to do this. LAMP assays can detect specific bacteria rapidly in the field, meaning you don't have to send samples away to a lab and wait for results. Faster information can support quicker decisions around monitoring, treatment planning, and biosecurity actions when problems first arise.



E.coli isolate from effluent.

The project

This project was delivered in three steps to move from lab proof-of-concept to practical, on farm testing:

1. Proof of concept in effluent: using standard lab methods such as polymerase chain reaction (PCR) and an existing LAMP assay, the team confirmed that *Campylobacter coli* could be detected in piggery effluent.
2. Respiratory pathogen detection: using PCR, the team then showed that the respiratory pathogen, *A. pleuropneumoniae* could be detected in spiked effluent.
3. On-farm tool development: the final stages focused on developing LAMP assays as POM tools to detect *A. pleuropneumoniae* and *E. coli*.

Value for industry

Point of Management testing has the potential to identify disease risk earlier, supporting faster response and better outbreak control, helping to reduce production losses and protect pig welfare.

Earlier detection and improved management of infectious disease can also reduce reliance on antimicrobials, strengthening the sustainability of intensive pig production systems.

Outcomes

The research team successfully developed POM LAMP assays capable of detecting both respiratory and enteric bacterial pathogens in piggery effluent.

These assays also provide a strong platform for expansion to other bacterial targets, with the optimsation lessons learned for *A. pleuropneumoniae* and *E.coli* able to be applied to future LAMP assay development.

More information

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