

Project Summary

Loop-mediated isothermal amplification tests to detect poultry pathogens

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Introduction

The loop-mediated isothermal amplification (LAMP) is a novel approach to nucleic acid amplification, and has the potential to aid in the detection of severe poultry diseases, such as Marek's disease, CAV, IBV and ILT.

Early detection of poultry pathogens using fast, affordable technology can ensure that Australia has the capacity to monitor these diseases routinely, in order to respond quickly and effectively to any outbreaks.

Due to the specific nature of the primers used, the amount of DNA produced in LAMP is considerably higher than PCR-based amplification, and also allows for easier visualisation with the naked eye.

The LAMP method shows potential to be ideal for rapid and low cost detection of poultry pathogens in the field, primarily because it is fast to perform and does not require specialized equipment.

Key findings

- This project offers a suite of rapid molecular tests, based on the LAMP method, to detect poultry pathogens, including MDV1, FAdV-8 and 11, CAV, IBV, ILT, M.g. and M.s.
- The LAMP tests can be performed on minimal and basic laboratory equipment, yet the tests provide sensitive and specific results, therefore, the health status of flocks can be determined at a much lower resource input and associated costs.
- The tests have proven to be suitable for monitoring pathogens on-farm through environmental samples, such as dust and fresh soft-tissue samples.

Conclusions

If applied to population derived samples (e.g. dust), LAMP assays have the potential to efficiently monitor flock health status.

This project offers the industry an additional suite of molecular tests with similar specificity, sensitivity and turnaround time of samples compared to real-time PCR tests, but at a lower cost.

The LAMP assays are sensitive and can detect viral pathogens in a chicken (with minimal impact on the animal) at a very early stage of the infection, usually long before clinical signs are present. This allows controlling infections rapidly and efficiently.

References

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