

TECH OFFER

On-site Molecular Diagnostic Platform for Livestock Disease Detection



KEY INFORMATION

TECHNOLOGY CATEGORY:

Life Sciences - Biotech Research Reagents & Tools

Life Sciences - Agriculture & Aquaculture

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175484**

OVERVIEW

This on-site molecular diagnostic platform enables rapid detection of pathogens in livestock, empowering farmers to identify infections early, before visible symptoms appear. Designed for field conditions, the kits are robust, cost-effective, and user-friendly. By enabling proactive disease surveillance at the farm level, the technology supports timely intervention, reduces antibiotic dependence, and enhances profitability through improved livestock health and reduced mortality losses. This technology combines a DNA extraction method that helps to preserve sample DNA and inactivate pathogens, together with lyophilised reaction beads. The system produces qualitative and semi-quantitative results and is compatible with downstream analyses such as qPCR and sequencing. The technology provider is seeking partnerships across the aquaculture and livestock value chain including research institutions, industry players, and government agencies to scale on-site disease detection and promote sustainable, biosecure food production globally.

TECHNOLOGY FEATURES & SPECIFICATIONS

- Nucleic Acid Extraction system
- Pathogen-specific nucleic acid amplification reagents
- All reagents are room-temperature stable and do not require cold-chain transport or special storage conditions
- Built using Loop-Mediated Isothermal Amplification (LAMP) technology, the system delivers lab-grade diagnostic results within 60 minutes
- DNA is preserved in lysis buffer; pathogens are inactivated
- Devices for sample processing (Quantitative/Qualitative Readouts)
- Ideal collaborators include aquaculture and livestock labs, feed mills, hatcheries, animal health companies, and government agencies seeking scalable disease detection tools.

POTENTIAL APPLICATIONS

The technology strengthens early warning and response mechanisms, supports biosecurity programs, and enables data-driven farm management across multiple segments of the animal health industry, including:

- Aquaculture: Facilitates routine pond-side monitoring of major shrimp diseases (e.g., WSSV, EHP, AHPND). Farmers currently use it for weekly pathogen surveillance to detect infections early and prevent severe outbreaks
- Livestock and marine species: Adaptable for detection of pathogens such as TiLV and ASF in both marine and terrestrial species

- Integrated programs: Can be incorporated into hatchery screening, feed mill quality control, and government surveillance schemes

MARKET TRENDS & OPPORTUNITIES

The global veterinary diagnostics market is projected to exceed USD 7.3 billion by 2030, driven by rising protein demand, increasing disease outbreaks, and the growing adoption of precision livestock farming. In shrimp aquaculture alone, annual disease losses exceed USD 5.9 billion globally.

UNIQUE VALUE PROPOSITION

- Point-of-care convenience: Performs lab-grade diagnostic on-site
- Rapid and cost-effective: Faster and cheaper than traditional PCR
- Field-deployable: Operates without a laboratory, cold-chain logistics, or experienced technicians
- High accuracy: Sensitivity and specificity comparable to PCR, validated in field trials
- Scalable hardware: Modular design suitable for both smallholder and commercial farms
- Versatile: Compatible with multiple pathogens across different species
- Facilitates export compliance: Provides reliable on-site testing data to verify product safety and minimize antibiotic residues