



Emergency Animal Diseases

Australia's livestock industry is worth over \$75 billion annually. The industry supports over 433,000 jobs, provides critical nutrition domestically and has an annual export value of >\$17 billion¹. Australia's disease-free status is crucial.

This industry status, the health of millions of animals and the associated health of humans, is threatened by possible incursions of Emergency Animal Diseases (EADs) like Foot-and-Mouth Disease (FMD), Lumpy Skin Disease (LSD), African Swine Fever, Avian influenza Virus and others.

Major outbreaks of EADs have occurred globally in recent years, especially in the Asia-Pacific². There remains a constant threat of disease incursion. If suspected cases were to occur in Australia, samples collected on farms, feedlots, saleyards, abattoirs, and other remote settings would need to be transported to centralised laboratories for testing. Obtaining results would likely take several days and possibly even 1-2 weeks, causing critical delays to outbreak responses.

There is an urgent need for deployable point-of-care (POC) testing platforms that can be used in field-based settings so that suspected EAD cases can be identified quickly. These POC platforms need to be high-quality, rapid and have secure real-time data management functions that integrate into existing state and Commonwealth surveillance and response systems.

The Threat of Lumpy Skin Disease

LSD is a contagious disease of cattle caused by the LSD virus which is usually transmitted through vectors including mosquitoes, biting flies, midges and ticks. It may also be transmitted via milk, semen or direct close contact.

The World Organization for Animal Health (WOAH) has identified LSD as one of the most economically important and notifiable trans-boundary diseases.

An incursion of LSD in Australia would have a significant economic impact on live cattle exports and the dairy industry.

Australia's *National Lumpy Skin Disease Action Plan*³ includes several objectives to strengthen our preparedness for a potential incursion. Among the key recommendations is for Australia to explore the use of POC tests to enable on ground responders to rapidly detect LSD cases during an outbreak situation.

ZiP Diagnostics' Solution

ZiP has developed a pan-capripoxvirus test to detect LSD, as well as sheepox and goatpox. This field-deployable test has a simple workflow and automated test result interpretation. It has high test high sensitivity and inclusivity, similar to laboratory-based PCR and delivers results within 10-30 minutes (typically 15 minutes).

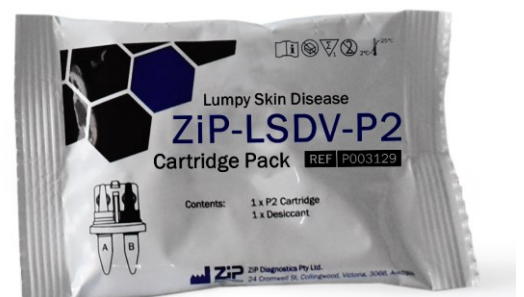
Australian Made

ZiP Diagnostics Pty Ltd is a Melbourne-based biotech manufacturer that was established in 2019. ZiP has a mission to provide rapid, accurate and low-cost tests to meet global diagnostic needs.

ZiP is fully Australian owned and has a long-term commitment to providing domestic manufacturing capability.

ZiP's end-to-end product development and manufacturing capabilities include PC-2 laboratory facilities, clean room facilities for manufacturing and packaging, and an engineering department for design and production of Industry 4.0, modular manufacturing automation equipment.

FOR RESEARCH USE ONLY



1. Meat and Livestock Australia, <https://www.mla.com.au/about-mla/the-red-meat-industry/>

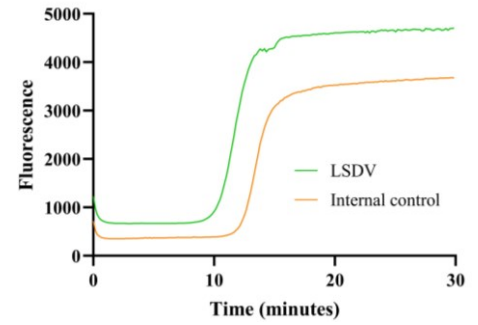
2. Australian Government Department of Agriculture, Fisheries and Forestry, <https://www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal>

3. Australian Government Department of Agriculture, Fisheries and Forestry, *National Lumpy Skin Disease Action Plan, 2022*

ZiP-LSDV-P2 Test Features

Target users	Approved outbreak response staff
Sample type	Skin/nodule biopsy, respiratory swab
Time to result	10-30 min (typically 15 minutes)
Diagnostic (clinical) sensitivity / specificity¹	Sensitivity 100%, specificity 100% compared to lab-based PCR
Analytical sensitivity	10-fold less sensitive than lab-based PCR
Analytical specificity - inclusivity	Pan-species detection of capripox viruses from cattle, sheep and goats in field samples from geographically dispersed regions
Analytical specificity - exclusivity	Assay is specific for capripoxvirus, no false positives Includes internal control
Precision¹	100%
Test usability	Minimally trained operator, no laboratory skills required

Representative amplification curve



¹ Preliminary study conducted by CSIROs Australian Centre for Diseases Preparedness (ACDP): Diagnostic sensitivity and specificity: 12/12 positive LSD samples and 12/12 negative samples for LSD detection (nodules, nasal and oral swabs). Precision: 100% concordance by 2 users that tested a total of 30 high, intermediate and negative samples over 5 days.

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ZiP-P2 Platform Features



ZiP-P2 Instrument

- Two test bays with random access, enabling 4-8 tests per hour.
- Weight: 2.3 kg, Dimensions (mm): 185 W x 205 D x 122 H.
- Workflow: Visually guided test workflow with integrated results screen.
- Automated test result analysis.
- A range of secure data export options with restrictions to authorised users only.
- Internal, fully automated calibration and instrument checks.
- No remote/preventative maintenance required.
- Battery operation options.

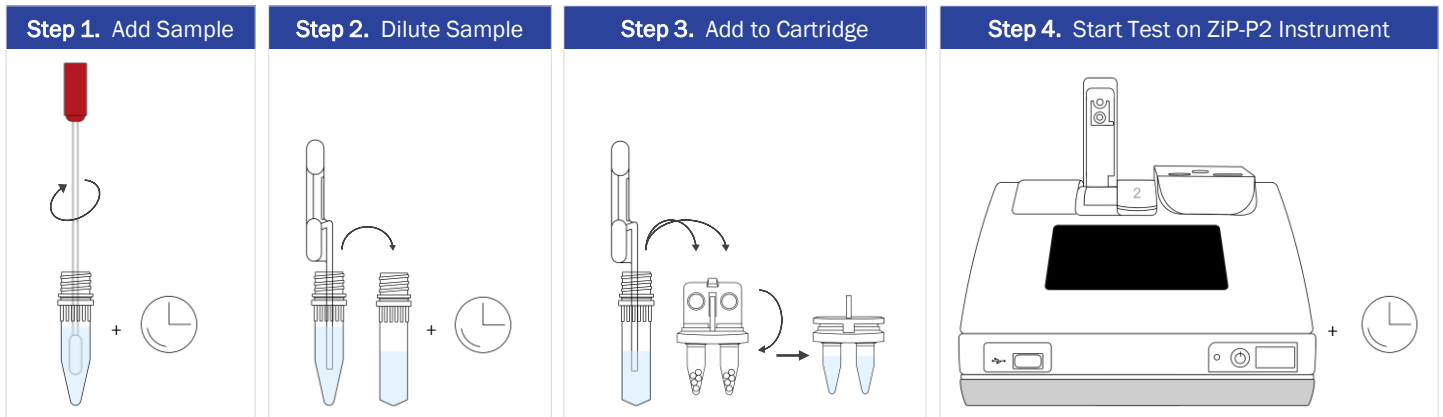


ZiP-P2 Cartridge

- Polypropylene cartridge containing lyophilised assay beads.
- No cold-chain transport or storage required.
- Multiplexing capability for up to four gene targets per test.
- A range of other tests available on the ZiP-P2 platform, including FMD.

Test Workflow

Simple 4 step process, guided by on-screen instructions. Minimal training required.
Runs up to two cartridges at one time, random access.



ZiP Diagnostics Pty Ltd
24 Cromwell St, Collingwood, Victoria, 3066, Australia
Phone +61 (0) 3 8414 5770 | Email bd@zipdiag.com

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