

## Background on Foot and Mouth Disease (FMD)

Foot and mouth disease (FMD) is a highly contagious viral disease of cloven-hoofed animals causing fever followed by the development of vesicles (blisters) chiefly in the mouth and on the feet.<sup>1</sup>

FMD is currently not known to occur in Australia. However new outbreaks of FMD have recently been reported in livestock in Indonesia including Bali.<sup>2</sup> As a precautionary measure, zoos should put additional biosecurity measures in place.

FMD is not considered a risk to public health as infection from animals to humans is extremely rare. FMD should not be confused with 'hand, foot and mouth disease', a human disease caused by a different virus which commonly affects young children.<sup>3</sup>

### Susceptible species

Domestic species known to be susceptible include: <sup>2</sup>

- Cattle
- Buffalo
- Camels
- Sheep
- Goats
- Deer
- Pigs

Non-domestic exotic species that are known to be susceptible include: <sup>2</sup>

- African buffalo
- Antelopes
- Bison
- Eland
- Elephants
- Gazelles
- Giraffe
- Impala
- Moose
- Warthog
- Wildebeest
- (Tapir may possibly be susceptible)

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<sup>1</sup> <https://www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal/fmd/aboutfmd#how-fmd-could-enter-australia>

<sup>2</sup> [https://wildlifehealthaustralia.com.au/Portals/0/Documents/MediaReleases/WHA\\_FMD\\_Information\\_V1.1\\_260722.pdf](https://wildlifehealthaustralia.com.au/Portals/0/Documents/MediaReleases/WHA_FMD_Information_V1.1_260722.pdf)

<sup>3</sup> <https://agriculture.vic.gov.au/biosecurity/animal-diseases/important-animal-diseases/foot-and-mouth-disease/about-foot-and-mouth-disease>

Little research has investigated susceptibility of Australian wildlife to infection with FMDV. However, some that have shown minimal disease or spread of infection following overseas experimental inoculation with FMD virus (FMDV) include:<sup>4</sup>

- Long-nosed bandicoot
- Bennett's wallaby
- Brown antechinus
- Short-beaked echidna
- Eastern grey kangaroo
- Red kangaroo
- Matschie's tree-kangaroo
- Possums
- Long-nosed potoroo
- Rakali (water rat)
- Common wombats

Severe clinical signs (vesicles on the tongue and footpads) rapidly progressing to mortality was reported for one captive Eastern grey kangaroo in a zoo in India.<sup>4</sup>

### Transmission risk

FMDV readily transmits between domestic and/or exotic animals known to be susceptible. The virus can be long-lived in the environment under certain conditions and can spread through the movement of animal products or contaminated materials/objects.<sup>5</sup>

Australia doesn't allow imports of any susceptible live animals, semen, uncooked meat, or unprocessed dairy products from FMD-affected countries or zones.<sup>6</sup>

New Zealand doesn't accept animal products from countries with FMD and has strict controls for imported animal products.<sup>7</sup>

FMDV is most likely to be introduced to the Australasian region through imported contaminated animal products or through objects (e.g. footwear) contaminated with FMDV that come in contact with susceptible animals.<sup>6</sup>

If FMDV is confirmed within the country, risks of FMD entering a zoo are likely to include:

- Contaminated objects/materials such as footwear, clothing, and vehicles.
- The acquisition of new animals to the zoo that are FMDV-infected.
- Feed products that are contaminated with FMDV (e.g. meat products, hay).

<sup>4</sup> Bhattacharya, S., Banerjee, R., Ghosh, R., Biswas, A. and Chatterjee, A., 2003. Identification of foot-and-mouth disease from a captive kangaroo in a zoological garden in India. *The Veterinary Record*, 153(16), p.504.

<sup>5</sup> <https://www.msdsvetmanual.com/generalized-conditions/foot-and-mouth-disease/foot-and-mouth-disease-in-animals>

<sup>6</sup> <https://www.agriculture.gov.au/biosecurity-trade/pests-diseases-weeds/animal/fmd/aboutfmd#how-fmd-could-enter-australia>

<sup>7</sup> <https://www.mpi.govt.nz/biosecurity/plans-for-responding-to-serious-disease-outbreaks/foot-and-mouth-disease/about-foot-and-mouth-disease/>

## Develop a site-specific biosecurity plan for FMD

The Zoo and Aquarium Association (ZAA) recommends that members develop a biosecurity plan specific to FMD that takes into consideration the individual site’s animal population/circumstances and is aligned with the relevant government’s biosecurity advice. Where possible, seek support from your veterinarian for the development of biosecurity protocols.

A site-specific biosecurity plan is recommended to be staged:

- (1) FMD has not been detected in the country.
- (2) FMD has been detected in the country.

The following resources may be helpful in developing a zoo site FMD biosecurity plan.

Factsheets	Planning resources
<p><a href="#">Department of Agriculture, Fisheries and Forestry</a></p> <p><a href="#">Animal Health Australia</a></p> <p><a href="#">Wildlife Health Australia</a></p> <p><a href="#">AusVet Plan Rare Valuable Species 5.1</a></p> <p><a href="#">Ministry of Primary Industries</a></p>	<p><a href="#">AUSVETPLAN Foot &amp; Mouth Disease</a> – see disease-specific documents for FMD</p> <p><a href="#">AUSVETPLAN Zoo Enterprise Manual</a></p> <p><a href="#">AUSVETPLAN Decontamination Manual</a></p> <p><a href="#">National Zoo Biosecurity Manual and Checklist</a></p> <p><a href="#">Farm Biosecurity Action Planner</a> – farm checklist with action items highly relevant for ZOOS</p> <p><a href="#">Farm Biosecurity Business Risk Management</a></p> <p><a href="#">Ministry of Primary Industries – FMD readiness</a></p>

## Considerations for FMD biosecurity planning

Biosecurity plans should consider the resources linked above and be developed in consultation with your veterinarian. Consultation with relevant government animal health agencies can assist to align the biosecurity plan with broader regional response plans. Some points to be considered in your initial planning should include the following:

- Audit staff or volunteer travel to any countries known to have FMD, especially regions with current outbreaks such as Indonesia/Bali.

- Audit staff or volunteer exposure to susceptible species outside the zoo (e.g. livestock at home, contact through other employment/volunteerism).
- Review uniform policy to reduce transmission risk (e.g. leaving work boots and uniforms onsite).
- Assess proximity to the zoo of farm animals on neighbouring properties and consider biosecurity measures to mitigate risk (e.g. fence lines to create buffer zones at property boundaries).
- Review animal encounter activities for risk to susceptible species and identify any risk mitigating actions.
- Review walkthrough areas for risk to susceptible species and identify any risk mitigating actions.
- Assess the ability to establish 'clean' bio secure zones around the zoo where outside soil or other organic material can be prevented/limited from entering.
- Review policy on vehicles entering/leaving the site (e.g. knowledge of vehicle movements prior to arrival, limitations to vehicle access on zoo site, ability to clean/disinfect vehicles coming onto zoo site).
- Assess food storage capabilities in case supply chains are impacted (meat products, hay, etc.)
- Communication to staff and volunteers – briefings, background on FMD and mitigating actions within your plan.
- Communication to visitors - updates to signage and website pages with careful consideration of wording. If concerned about visitors who have contact with livestock, we'd recommend requesting them to be careful with footwear/clothing rather than asking them not to visit.