

BIAZA Guidance on SARS COV-2 Vaccination in Animal Species

SARS-COV-2 is the virus responsible for Covid-19, which was first described in December 2019. It was first reported in animals in early 2020 and has subsequently been declared a notifiable disease by the World Organisation for Animal Health (OIE) and also as a Notifiable Disease in England, Scotland and Wales where vets must report all confirmed cases to APHA.

Epidemiological studies predicted a broad host range for SARS-COV-2 based on the ability of the spike protein to bind to the host cell receptor ACE-s, from primates and carnivores to ungulates. Inter- and intraspecific onward transmission has been widely reported and infected species (in agricultural and domestic settings) have been shown to transfer the virus to each other and back to humans. SARS-COV-2 has now been reported in a number of zoo-housed taxa, including felids, non-human primates and mustelids.

Globally, some zoos, aquariums and range country sanctuaries are taking steps to vaccinate groups of higher-risk species, notably non-human primates, with an experimental recombinant vaccine produced by [Zoetis](#) Inc. This vaccine was originally developed for domestic pets and has had initial efficacy studies conducted in cats and dogs. As the mink industry began to be impacted in 2020, Zoetis transitioned and has also now conducted safety and efficacy studies for mink. The vaccine is currently being further developed for licensure to be used in mink. Zoetis is currently producing an experimental batch of vaccine for use in North American mink as a 500-dose per vial presentation. Zoetis have generously confirmed that they will be making a second 10-dose per vial batch of vaccine that will be available for use in zoos and aquariums, at zero or low cost.

Pending import licensing approval, BIAZA member zoos and aquariums may therefore wish to review this option and should do so following standard infectious disease risk assessment processes, considering not only species risk level, but also specific facility and husbandry routine. A risk:benefit analysis should be carried out and the following logistical points might be usefully considered:

- Ease of administration (considering level of positive reinforcement training behaviours in animals). Individuals will need 2 doses 21 days apart, ideally given subcutaneously, although intramuscular may also be effective.
- Storage capacity. Vaccines are likely to be provided in 10 dose bottles, needing to be stored at 4°C. As this is an experimental vaccine, there is no preservative therefore the vaccine vial should be used within 24 hours of opening.
- Ability to apply for import permits from US to UK/Europe. BIAZA is in discussion with UK Government around national import licences and will support zoos with individual permit applications if required.
- SARS-COV-2 animal testing
 - o PCR and lateral flow assay options are currently being offered by the US Zoetis Reference Lab

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- Serum neutralization testing is offered by Cornell University Diagnostic Lab
- Ability to carry out follow-up antigen testing procedures and serology (not required although this could support wider research efforts).

We will continue to liaise with Zoetis, and also our international zoo and veterinary networks to review the situation. We look forward to more feedback and analysis from those well-researched cases where confirmed cases have been identified and where vaccination has been carried out e.g. San Diego Zoo. In the longer-term, advice may change and more zoos might feel it necessary to vaccinate susceptible species.

Any BIAZA member zoo or aquarium who should decide to pursue vaccination for their animals should contact John Hardham (Research Director, Global Biologics Director, Zoetis Center for Transboundary and Emerging Diseases): john.m.hardham@zoetis.com. Please also keep the [BIAZA Office](#) informed, in order to support import license negotiations.

Regardless of vaccination, we strongly urge all collections to continue to maintain high standards of biosecurity and proper use of PPE.

Further Reading and References

European Association of Zoo and Wildlife Veterinarians – Transmissible Diseases Handbook: https://cdn.ymaws.com/www.eazwv.org/resource/resmgr/files/transmissible_diseases_handbook/5th_ed_transmissible_diseases_handbook/chapters/covid19_faqv8_5_march21.pdf

Ferasin *et al.* 20210. BioRxiv. Myocarditis in naturally infected pets with the British variant of COVID-19: <https://www.biorxiv.org/content/10.1101/2021.03.18.435945v1>