

PREVENTATIVE MEDICINE PROGRAMMES FOR HOOFSTOCK IN THE MIDDLE EAST

Lorea Cardas¹, Tom Bailey^{1,2} & Declan O'Donovan²¹ Dubai Falcon Hospital, PO Box 23919, Dubai, UAE. ²Wadi Al Safa Wildlife Centre, Dubai, UAE

INTRODUCTION



Treatment of impala using a Tamer II (T Bailey)

Preventative medicine programmes are especially important for captive wildlife roaming in large enclosures, as health monitoring may be particularly challenging in these conditions. Having information on regional and local occurrence of diseases is useful in the design of preventative medicine protocols, particularly in the Middle East where infectious diseases are prevalent. Exotic and native ungulate species kept in captivity in the Middle East are at risk of diseases present in both wild and domestic hoofstock in the local area. Currently Peste des petits ruminants (PPR) and Sheep and goat pox are regarded by OIE as present in the UAE, while Foot and mouth disease (FMD) was last reported in 2009 (OIE, 2009). Information gathered by regionally located veterinary laboratories may be useful when designing a preventative medicine program for a captive wildlife collection. Regional veterinary laboratories are often the first line in animal disease diagnosis. The bacterial, viral and parasitic conditions diagnosed in wild and domestic hoofstock at one laboratory in the UAE during 2008 are listed in Table 1. Other conditions that may affect semi-captive ruminants, depending on soil and water composition, are nutritional deficiencies. Copper deficient soils are believed to exist widely in the UAE, possibly in relation with highly mineralized ground waters (O'Donovan, 2005)

	PARASITES	VIRUS	BACTERIA
Wild ungulates	Coccidia (<i>Eimeria</i> spp) Ticks (<i>Hyalomma</i> spp) <i>Nematodirus</i> spp <i>Trichuris</i> spp	FMD virus Lumpy skin*	CCPP Clostridia Pasteurella
Goat/sheep	<i>Cisticercus tenuicollis</i> Coenurosis (<i>Multiceps multiceps</i>)	PPR	Brucellosis

Table 1: Conditions diagnosed at the Central Veterinary Research Laboratories during 2008 in wild and domestic ruminants in the UAE (CVRL, 2008).

*Lumpy skin disease was diagnosed in Arabian oryx in 2009.

AN EXAMPLE OF A PREVENTATIVE MEDICINE PROGRAMME: WADI AL SAFA WILDLIFE CENTRE

A wildlife collection that has developed its own preventative medicine programme in the Middle East is Wadi Al Safa Wildlife Centre (WASWC) in the UAE. This protocol is based on the characteristics of the species and the area, the occurrence of disease and the practical aspects of animal management in the site.

Once a year the semi-captive ungulates in this site are caught and physically immobilized using a restraint device (Tamer™) (O'Donovan & Bailey, 2006; MacNamara & Williamson, 2008). This allows a complete physical examination and the administration of prophylactic drugs without the need of a chemical immobilization in various semi-free ranging ruminant species (MacNamara & Blue, 2007). In this way up to 70 Arabian oryx can be processed in a single day at the WASWC. The prophylactic products administered at WASWC aim to prevent conditions known to occur in free range ungulates (hypovitaminosis, selenium deficiency) as well as the infectious and parasitic diseases that could pose a greater danger to the collection (Table 2). Blood samples are also taken from selected animals from different locations to check for trace element and vitamin levels.

Table 2: Prophylactic drugs and frequency of administration

PROPHYLACTIC PRODUCT	FREQUENCY OF ADMINISTRATION
Clostridial vaccine	Annual
FMD vaccine (Serotypes present on the area)	Annual
Sheep and Goat Pox vaccine	Annual
Oral antiparasitic	Annual
Topical (pour-on) antiparasitic	Annual
Vitamin E + Selenium	Annual
Multivitamin injection	Annual

As stated above, in this wildlife collection ruminants are vaccinated annually against FMD, lumpy skin disease (capripox virus) and clostridial diseases (*Clostridium perfringens*, *C. septicum*, *C. novyi* and *C. chauvoei*). It could be argued that some of these vaccines are formulated to be boosted every six months. However, due to climatic conditions and number of restraint events required, this is not always possible. There is some circumstantial evidence to indicate that vaccination protocols regarded as incomplete till now may confer protection. Bailey et al (2009) recently showed that a collection of wild ungulates vaccinated annually against FMD had lower mortality rates and milder signs when compared to an unvaccinated collection that was challenged by the same virus strain during a FMD outbreak in the UAE in 2009.



Vaccination of Arabian oryx (T Bailey 2010)

Although it could seem logical that the administration of too many antigens (i.e. multiple vaccines) at the same time might decrease the immune response to each of them, many studies suggest the opposite (see for example Stratton et al, 2002). Furthermore, other wildlife collections in the region successfully utilise immunization protocols in which more vaccines are given at the same time (T. Bouts, personal communication). With the exception of a study by Kilgallon et al (2008) on the response of Arabian oryx to vaccination with FMD vaccine few studies looking at the protection given to non-domestic ungulates using vaccines commercially manufactured for domestic cattle and sheep have been conducted. Undoubtedly, more work needs to be done to establish the efficacy of vaccination regimens in Arabian hoofstock.

ACKNOWLEDGMENTS

We thank Tim Bouts from the Zoological Society of London for his helpful comments. A full version of this paper including references is available on the website.

REFERENCES

Bailey, T., O'Donovan, D., Kinne, J. and Wernery, U. (2009) Observations on Foot and Mouth Disease in Vaccinated and Unvaccinated Wildlife in the United Arab Emirates. Proceedings of the 58th Annual Conference of the Wildlife Disease Association, Blain, Washington, August 2-7 2009. Pp 141.

CVRL (Central Veterinary Research Laboratory) Annual Report 2008. <http://www.cvrl.ae/>

Kilgallon, C., Bailey, T.A., O'Donovan, D., Wernery, U. and Alexandersen, S. (2008). A Temporal Assessment of Seroconversion in Response to Inactivated Foot and Mouth Disease Vaccine in Arabian Oryx (*Oryx leucoryx*). Veterinary Record. 163: 717-720.

MacNamara, M and Blue, A. (2007). The use of a portable corral systems and tamers in the management of captive and free range hoofstock. Wildlife Middle East News 1, 4:5

MacNamara, M and Williamson, L. (2008) Restraint of Prezwalski's horses for reproductive studies at the National Zoo's conservation and research center. Wildlife Middle East News 3,3:8.

O'Donovan, D (Unpubl), Some Physiological and Morphological Parameters of the Arabian oryx (*Oryx leucoryx*), MSc Thesis, 2005, Manchester Metropolitan University, UK.

O'Donovan, D. and Bailey, T. (2006) Restraint of Arabian oryx (*Oryx leucoryx*) in Dubai, United Arab Emirates using a mobile raceway, Proceedings of the 2nd Conference of the International Congress of Zookeepers: Gold Coast, Australia.

OIE- World Animal Health Information Database (WAHID) - Version: 1.3. Release date: 29 Sept 2009. http://www.oie.int/wahis/public.php?page=country_status&year=2008

Stratton, K, Wilson, C. B., and McCormick M. C. (Eds) (2002) Immunization safety review: Multiple immunizations and immune dysfunction. Institute of Medicine. National Academy Press, Washington (USA)