

INCIDENCE, CAUSES AND REDUCTION OF NEONATAL MORTALITY
IN ZOO UNGULATES

James K Kirkwood
Department of Veterinary Science
Institute of Zoology
Zoological Society of London
Regent's Park
London NW1 4RY
U.K.

As the role of zoos changes from being collections of animals kept purely to entertain and intrigue the public, to centres for the study and propagation of wild animals for their conservation, it becomes essential to critically examine the productivity rates of the species held, and the factors affecting these. This information is of fundamental importance in planning arrangements for the longterm maintenance of self-sustaining captive populations.

One factor that has a major impact on rates of population growth of many species in captivity is the rate of neonatal mortality. Perinatal and early mortality in captive wild ungulates has been reported to be quite high, and often considerably greater than occurs in comparable domestic species under ideal management conditions.

To assess the incidence and causes of perinatal and early mortality in wild ungulates born at the Zoological Society of London's collections at Regent's Park and Whipsnade, a retrospective survey of those born between 1975 and 1985 was undertaken. It was found that of almost 2,500 births, 35% died prior to reaching six months of age. (Table 1). Although few comparable studies have been published, it appears that this figure is fairly typical. In wild populations, the scale of mortality in this age group varies considerably between and within species, but may generally be of a similar magnitude. Nevertheless, with improvements in management it is likely that significant reductions could be achieved in captivity.

Table 1. Infant mortality in ungulates at the Zoological Society of London.

	<u>No. born</u>	<u>No. died < 6 months old*</u>	<u>%</u>
Equidae	104	31	30
Tapiridae	2	0	-
Rhinocerotidae	24	1	4
Camelidae	212	47	22
Suidae	91	27	30
Tayassuidae	34	13	38
Hippotamidae	6	4	67
Cervidae	872	297	34
Giraffidae	14	4	29
Bovidae	1120	442	39

* includes still births and abortions

A number of management-related factors were implicated as predisposing causes of neonatal mortality in this survey:

1. Inappropriate birth season. Babies born to aseasonal Bovidae and Cervidae in winter had high rates of mortality eg Sitatunga Tragelaphus spekei and Axis deer Cervus axis (Fig 1).
2. Type of accommodation. Comparative of mortality rates within and between species kept in different accommodation, suggested that housing had significant effect in some cases. It was suspected that close proximity to the public and inadequate shelter were partly responsible for high infant mortality in some species. (eg Some Bovidae kept at Regent's Park).
3. Maternal nutrition. Mortality amongst 1 week to six months-old Scimitar-horned Oryx, Oryx dammah born at Regent's Park was high (12/26 ie. 46%), compared with 13% (2/15) at Whipnade. A difference in maternal nutrition was suspected.

Measures that have been introduced to reduce infant mortality in ungulates include:

1. Prevention of winter births, (by exclusion of fertile males for 6 months of the year) or collection of winter babies for hand-rearing.
2. Improvements in accommodation.
3. Improvements in maternal nutrition (eg recent changes to the reindeer diet appears to have lead to improved viability of young).
4. Vaccinations and administration of hyper-immune sera to neonates.

Although it is likely that the rates of infant mortality presently seen in captive wild ungulates will be reduced, from the point of view of predicting future population size and growth, it is relevant to note that the present evidence indicates that typically 1/5 to 1/3 of those born die before reaching breeding age.