

husbandry, research and zoos

Longevity of captive mammals in Philadelphia Zoo

ROBERT L. SNYDER¹ & SUSAN C. MOORE²

¹ Associate Director, Penrose Research Laboratory, Zoological Society of Philadelphia, and Assistant Professor of Comparative Pathology, University of Pennsylvania, USA

² Research Trainee, Penrose Research Laboratory, Zoological Society of Philadelphia, USA

ABSTRACT

Data on longevity of captive mammals were compiled from post-mortem records filed in the Penrose Research Laboratory of the Zoological Society of Philadelphia. Maximum exhibition periods were reported for 42 families of mammals exhibited between 1901 and 1964. The longest exhibition period was 593 months for an echidna of the family Tachyglossidae. Mean exhibition periods and mortality patterns for 20 families were presented for two periods, 1901-34 and 1935-64. Average duration of life on exhibition increased considerably following changes in diets in 1935, with 12 families showing significant increases in longevity. The effects of larger cages, improved facilities, and the use of antibiotics and vaccines representing further changes in the environment during the period from 1935-64, were also analysed in relation to increased longevity.

INTRODUCTION

This report on longevity of captive mammals is presented for its potential value to scientists concerned with problems of ageing. The data were compiled from post-mortem records filed in the Penrose Research Laboratory of the Zoological Society of Philadelphia. The data were tabulated by the taxonomic grouping of family rather than by species to provide adequate sample sizes for statistical analysis. Maximum exhibition periods are listed for 42 families and mean exhibition periods (i.e. mean duration of life in the zoo) for 20 families. Mortality patterns of 20 families are illustrated in life table form. The report covers the mammals that died between 1901 and 1964. Environmental factors are discussed in relation to their effects on longevity.

MATERIALS AND METHODS

Longevity records. Records of births, deaths, purchases and sales of animals were maintained routinely after the Philadelphia Zoo opened in

1874. Animals were identified by cage assignment and the register was checked by annual inventories of the collection. With the establishment of the laboratory and museum of comparative pathology in 1901, each animal that died was autopsied to determine the cause of death. Records of post-mortem examinations begin with an antelope that died on 24 November 1901 and continue in an unbroken series through 1965 to include observations on more than 20,000 mammals, birds and reptiles. The length of exhibition period was recorded for the majority of these animals.

The authenticity and accuracy of these records are corroborated by evidence contained in annual reports published by the laboratory beginning in 1904. Knowledge of longevity was important to the study of diseases of captive animals, which was the primary function of the laboratory and museum. For this reason the scientific personnel were vitally concerned with the accuracy of the records. The first analysis of the data on exhibition periods of mammals and birds in the garden which was published in the annual report of 1934 (Tobin, 1934), was based on 'the records in the administration and laboratory offices of the exhibition periods of mammals and birds displayed in the Philadelphia Zoological Garden. Each member of the collection has been recorded from the date of reception to the date of death, so that an exhibition period is obtained from the two dates.' This report covered the period from 1909-34. Special reports on longevity were subsequently published in the annual reports of 1935 (Tobin, 1935), 1936 (Tobin, 1936), 1937 (Duetz, 1937), 1938 (Duetz, 1938) and 1939 (Duetz, 1939). Duetz commented in the 1939 report that, for some time past, small monkeys had been tattooed with numbers, so that possibilities of confusion were being eliminated. 'We realize that in the past some errors may have been made in recording the exhibition ages of individuals of small varieties caged in groups. However, every effort has been made at all times

	COMMON NAME	SCIENTIFIC NAME	SEX	MONTHS	
Order: Artiodactyla					
	Bovidae	African buffalo	<i>Syncerus caffer</i>	♀	315
	Camelidae	Dromedary camel	<i>Camelus dromedarius</i>	♂	341
	Cervidae	Malayan Sambar deer	<i>Cervus unicolor</i>	♂	233
	Hippopotamidae	Common hippopotamus	<i>Hippopotamus amphibius</i>	♂	433
	Suidae	Wild boar	<i>Sus scrofa</i>	♂	194
	Tayassuidae	Collared peccary	<i>Tayassu tajacu</i>	♀	203
Order: Carnivora					
	Canidae	Red wolf	<i>Canis niger</i>	♀	177
	Felidae	Leopard	<i>Panthera pardus</i>	♂	233
	Hyaenidae	Spotted hyaena	<i>Crocuta crocuta</i>	♂	298
	Mustelidae	American badger	<i>Taxidea taxus</i>	♂	242
	Procyonidae	White-nosed coati	<i>Nasua nasua narica</i>	♀	177
	Ursidae	Japanese brown bear	<i>Ursus arctos lasiotus</i>	♀	387
	Viverridae	Binturong	<i>Arctictis binturong</i>	♀	216
Order: Edentata					
	Bradypodidae	Two-toed sloth	<i>Choloepus didactylus</i>	♀	278
	Dasypodidae	Nine-banded armadillo	<i>Dasypus novemcinctus</i>	♀	124
	Myrmecophagidae	Giant anteater	<i>Myrmecophaga tridactyla</i>	♀	62
Order: Hyracoidea					
	Procaviidae	Cape hyrax (2 specimens)	<i>Procavia capensis</i>	2♀	106
Order: Insectivora					
	Erinaceidae	European hedgehog	<i>Erinaceus europaeus</i>	♀	50
Order: Marsupialia					
	Didelphiidae	Philander opossum	<i>Caluromys philander</i>	♀	25
	Macropodidae	Great grey kangaroo	<i>Macropus kanguru</i>	♀	193
Order: Monotremata					
	Tachyglossidae	Australian short-beaked echidna	<i>Tachyglossus aculeatus</i>	♀	593
Order: Perissodactyla					
	Equidae	Mongolian wild horse	<i>Equus przewalskii</i>	♂	364
	Tapiridae	Brazilian tapir	<i>Tapirus terrestris</i>	♂	195
	Rhinocerotidae	Indian rhinoceros	<i>Rhinoceros unicornis</i>	♀	239
Order: Pinnepedia					
	Otariidae	California sealion	<i>Zalophus californianus</i>	♀	246
Order: Primates					
	Tupaidae	Common tree-shrew	<i>Tupaia glis</i>	♀	26
	Callithricidae	Common marmoset	<i>Callithrix jacchus</i>	♂	74
	Cebidae	Tufted capuchin	<i>Cebus apella</i>	♀	247
	Cercopithecidae	Moor macaque	<i>Macaca maurus</i>	♂	337
	Lemuridae	Mongoose lemur	<i>Lemur m. mongoz</i>	♀	304
	Lorisidae	Slow loris	<i>Nycticebus coucang</i>	♂	99
	Pongidae	Chimpanzee	<i>Pan troglodytes</i>	♂	454
Order: Proboscidea					
	Elephantidae	Indian elephant	<i>Elephas maximus</i>	♀	457

continued