

contraception data recording system to ensure that all relevant information is being collected.

Although the ungulate contraception database is, as yet, relatively small, the information does provide a starting point for the animal manager to make more informed decisions. Selection of the most appropriate birth control method should take into account such factors as the future genetic value of the individual, space and social factors, the consequences of a contraceptive failure and the ease of administration. Sterilization should only be considered for those individuals that are no longer required to contribute to the breeding programme. Separation of the sexes is a viable option if the space to do so is available and the social disruption is minimal. Of the two currently available reversible contraceptive methods that were reported in use with ungulates both are ♀ directed but differ in their duration of effectiveness and mode of administration. The MGA implant, which requires a surgical procedure, should be effective for at least two years while Depo-Provera, an injectable contraceptive, should be effective for two to three months. For species that are seasonal breeders and difficult to anaesthetize or restrain in a chute, Depo-

Provera may be an attractive alternative. If the trial contraceptive methods mentioned in this paper are successful they will provide the manager with additional alternatives including a reversible ♂-directed option.

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PRODUCTS MENTIONED IN THE TEXT

Depo-Provera: manufactured by The Upjohn Company, Kalamazoo, MI 49001, USA.

Melengestrol Acetate Implant: not commercially available but provided as a service to the zoological community by Dr Edward Plotka, Marshfield Medical Research Foundation, 1000 N Oak Avenue, Marshfield, WI 54449-1830, USA.

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Longevity of ungulates in captivity

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In 1958 the author distributed a series of papers in mimeograph form summarizing data collected to that date on the subject

of longevity of mammals in captivity. These were sent to a number of colleagues at a few selected zoological gardens, who

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had been most helpful in the collection of information on the subject. The data had been taken from the work of Flower (1931), with some correspondence received by The Zoological Society of London after Flower's death, and examination of animal records at zoological gardens in America and Europe. The 1958 series was widely quoted by Crandall (1964). Between 1958 and 1992 a number of papers were published in several journals updating the early information, including one on primate longevity (Jones, 1968).

From 1951 to 1992 I have been able to examine zoo archives at most of the major collections in North America, Europe and Australia, and add additional data from numerous journals published by the world community. Over the years, zoo personnel have provided information on animals in their collections which they believed were record holders and most studbook keepers have also been co-operative. It is thanks to all of these people that this current updated listing for ungulates is possible.

This paper is the first comprehensive listing for every species and subspecies of ungulate for which I have a verified longevity record, including an initial date of entry (birth, capture, arrival) and date of death where appropriate. Anecdotal records have not been included. Space does not allow all the information to be listed in Table 1 but it is available from the author.

Some may question the nomenclature used in Table 1 and like all summaries one must depend on the accuracy of the zoo records concerned. In the early years of zoological gardens, through to about 1945, zoos had an active collaboration with local natural history museums. Zoo staff often accompanied museum staff on expeditions for new material and many species have been described for science based on living or recently deceased zoo specimens. Zoos, such as Berlin and Washington NZP, often undertook large scale expeditions with zoo staff who were

accomplished professional zoologists; their practice when purchasing animals from dealers was to obtain either the capture locality or the name of the supplying collection, and details were recorded in the archives making accurate identification possible.

In other cases identification was less accurate. Many collections acquired American wapiti and used the name then widely in use, *Cervus canadensis*. The origin of the specimens was not always known. Today we call the American wapiti *Cervus elaphus canadensis* but it is highly unlikely that any of the past or present stock really represents the true eastern race. [*C. e. canadensis* Erxleben 1777, Eastern Canada, Corbet (1978): 201.] In Table 1 some species names are followed by known subspecific specimens.

The zoo curator of 1993 may not follow the same methods of animal identification as those of the past. The application of new testing procedures, such as karyotyping, may call into question the names originally allocated when the criteria utilized were differences in anatomy, pelage colour or location of habitat. The studbook for Kirk's dik-dik *Madoqua kirki* does not use subspecific names because the exact origin of all specimens could not be traced and cytogenetic analysis could only be used to establish family lines.

The data presented in Table 1 follow the taxonomy of Corbet & Hill (1991) as adapted by the *International Zoo Yearbook*. Inter-specific hybrids have been excluded but a few intra-specific crosses have been mentioned, since they may have lived longer than other specimens. Domestic animals have not been shown except those which the *Yearbook* regularly collects data on such as the Alpaca *Lama pacos* and the Llama *Lama glama*. Specimens with a superscript following the year of record were alive as at that date; some were transferred to other collections for which accurate records are not available, but many are still alive in 1993.

	AGE (yrs)	YEAR (mths)		AGE (yrs)	YEAR (mths)
PERISSODACTYLA			Sumatran rhinoceros		
EQUIDAE			<i>Dicerorhinus sumatrensis</i> 32 8 1900		
Przewalski horse			Southern white rhinoceros		
<i>Equus przewalskii</i>	38	3 1939	<i>Ceratotherium s. simum</i> 40 8 1987		
Mongolian wild ass or Dziggetai			Northern white rhinoceros		
<i>Equus h. hemionus</i>	25	4 1984	<i>C. s. cottoni</i> 35 4 1985		
Syrian wild ass			Black rhinoceros		
<i>E. h. hemippus</i>	22	10 1879	<i>Diceros bicornis</i> 34 0 1948		
Iranian onager			East African black rhinoceros		
<i>E. h. onager</i>	28	4 1992 ¹	<i>D. b. michaeli</i> 45 10 1980		
Kulan or Turkmenian wild ass			South African black rhinoceros		
<i>E. h. kulan</i>	21	5 1987	<i>D. b. minor</i> 5 1 1993 ¹		
Indian wild ass			Somali black rhinoceros		
<i>E. h. khur</i>	25	3 1863	<i>D. b. brucii</i> 9 10 1917		
Western kiang			ARTIODACTYLA		
<i>Equus k. kiang</i>	26	3 1934	SUIDAE		
Eastern kiang			Bush pig or Red river hog		
<i>E. k. holdereri</i>	26	7 1993 ¹	<i>Potamochoerus porcus</i> 21 7 1981		
Nubian wild ass			High forest bush pig		
<i>Equus a. africanus</i>	24	1 1925	<i>P. p. daemonis</i> 15 7 1970		
Somali wild ass			Abyssinian bush pig		
<i>E. a. somaliensis</i>	20	8 1991 ¹	<i>P. p. hassama</i> 13 1 1950		
Burchell's zebra			Southern bush pig		
<i>Equus b. burchelli</i>	31	6 1903	<i>P. p. koiropotamus</i> 10 5 1917		
Grant's zebra			Lowland bush pig		
<i>E. b. boehmi</i>	29	5 1988	<i>P. p. nyasae</i> 7 0 1930		
Damara zebra			Bornean bearded pig		
<i>E. b. antiquorum</i>	29	8 1972	<i>Sus b. barbatus</i> 16 0 1940		
Chapman's zebra			Sumatran bearded pig		
<i>E. b. chapmani</i>	29	6 1977	<i>S. b. oi</i> 14 8 1920		
Crawshay's zebra			Pygmy hog		
<i>E. b. crawshaii</i>	5	2 1907	<i>Sus salvanius</i> 14 0 1922		
Grevy's zebra			Central European wild boar		
<i>Equus grevyi</i>	28	9 1975	<i>Sus s. scrofa</i> 21 0 1949		
Quagga			North African wild boar		
<i>Equus quagga</i>	21	4 1872	<i>S. s. algira</i> 9 0 1919		
Cape mountain zebra			Middle Eastern wild boar		
<i>Equus z. zebra</i>	26	3 1919	<i>S. s. attila</i> 13 2 1921		
Hartmann's mountain zebra			Indian wild boar		
<i>E. z. hartmannae</i>	26	6 1993 ¹	<i>S. s. cristatus</i> 9 6 1910		
TAPIRIDAE			Japanese wild boar		
Baird's tapir			<i>S. s. leucomystax</i> 20 11 1967		
<i>Tapirus bairdi</i>	27	10 1993 ¹	Mediterranean wild boar		
Malayan tapir			<i>S. s. meridionalis</i> 9 5 1934		
<i>Tapirus indicus</i>	29	4 1958	Chinese wild boar		
Mountain or Woolly tapir			<i>S. s. moupinensis</i> 2 0 1909		
<i>Tapirus pinchaque</i>	23	10 1991	Indonesian wild boar		
	23	8 1993 ¹	<i>S. s. vittatus</i> 12 8 1938		
South American tapir			Javan warty pig		
<i>Tapirus terrestris</i>	30	5 1914	<i>Sus v. verrucosus</i> 17 0 1945		
	30	4 1993 ¹	Sulawesi warty pig		
			<i>S. v. celebensis</i> 11 0 1960		
RHINOCEROTIDAE			Wart hog		
Javan rhinoceros			<i>Phacochoerus aethiopicus</i> 18 9 1958		
<i>Rhinoceros sondaicus</i>	21	0 1907	Giant forest hog		
Indian rhinoceros			<i>Hylochoerus meinertzhageni</i> 2 10 1957		
<i>Rhinoceros unicornis</i>	40	4 1904			

	AGE (yrs)	YEAR (mths)		AGE (yrs)	YEAR (mths)
<i>Sula babirusa</i>					
<i>Babyrousa b. babyrussa</i>	10	1	1925		
Sulawesi babirusa					
<i>B. b. celebensis</i>	21	4	1920		
TAYASSUIDAE					
White-lipped peccary					
<i>Tayassu pecari</i>	14	11	1944		
South Mexico white-lipped peccary					
<i>T. p. ringens</i>	11	11	1945		
Costa Rican white-lipped peccary					
<i>T. p. spiradens</i>	21	1	1987		
Collared peccary					
<i>Tayassu tajacu</i>	24	8	1934		
Texas collared peccary					
<i>T. t. angulatus</i>	16	11	1939		
East Mexico collared peccary					
<i>T. t. crassus</i>	10	3	1921		
Costa Rican collared peccary					
<i>T. t. crasinigrum</i>	3	6	1935		
Sonoran collared peccary					
<i>T. t. sonoriensis</i>	22	4	1983		
Chaco peccary					
<i>Catagonus wagneri</i>	6	2	1993 ¹		
HIPPOPOTAMIDAE					
Hippopotamus					
<i>Hippopotamus amphibius</i>	58	9	1993 ¹		
Pygmy hippopotamus					
<i>Choeropsis liberiensis</i>	42	4	1980		
CAMELIDAE					
Llama					
<i>Lama glama</i>	21	6	1926		
Guanaco					
<i>Lama guanicoe</i>	28	4	1971		
Alpaca					
<i>Lama pacos</i>	18	2	1922		
Vicugna					
<i>Lama vicugna</i>	28	8	1991 ¹		
Arabian camel or Dromedary					
<i>Camelus dromedarius</i>	28	5	1942		
Bactrian camel (domestic)					
<i>Camelus ferus (= bactrianus)</i>	35	5	1968 ¹		
TRAGULIDAE					
Water chevrotain					
<i>Hyemoschus aquaticus</i>	3	4	1952		
Lesser Malay chevrotain					
<i>Tragulus javanicus ravidus</i>	13	0	1992 ¹		
Indian chevrotain or Mouse deer					
<i>Tragulus meminna</i>	6	9	1965		
Larger Malay chevrotain					
<i>Tragulus n. napu</i>	16	4	1983		
Riou chevrotain					
<i>T. n. stanleyanus</i>	4	11	1915		
MOSCHIDAE					
Siberian musk deer					
<i>Moschus m. moschiferus</i>	13	11	1974		
CERVIDAE					
Chinese water deer					
<i>Hydropotes i. inermis</i>	13	11	1983		
Korean water deer					
<i>H. i. argyropus</i>	5	11	1992		
Black muntjac					
<i>Muntiacus crinifrons</i>	6	0	1891		
Fea's muntjac					
<i>Muntiacus feae</i>	6	0	1984 ¹		
Javan muntjac					
<i>Muntiacus m. muntjak</i>	12	0	1915		
Indochina muntjac					
<i>M. m. annamensis</i>	11	10	1948		
South Indian muntjac					
<i>M. m. aureus</i>	4	0	1899		
Thailand muntjac					
<i>M. m. curvostylis</i>	4	3	1902		
Malabar muntjac					
<i>M. m. malabaricus</i>	16	6	1851		
Sumatran muntjac					
<i>M. m. montanus</i>	6	3	1919		
Indian muntjac					
<i>M. m. vaginalis</i>	14	11	1941		
Chinese muntjac					
<i>Muntiacus r. reevesi</i>	19	8	1981		
Formosan muntjac					
<i>M. r. micrurus</i>	10	11	1992		
Western tufted deer					
<i>Elaphodus c. cephalophus</i>	12	0	1993 ¹		
Hupeh tufted deer					
<i>E. c. ichangensis</i>	6	10	1939		
Michie's tufted deer					
<i>E. c. michianus</i>	4	0	1993 ¹		
Fallow deer					
<i>Dama dama</i>	18	9	1861		
Persian fallow deer					
<i>D. d. mesopotamica</i>	20	0	1988		
Indian axis deer					
<i>Axis a. axis</i>	20	9	1936		
Sri Lankan axis deer					
<i>A. a. ceylonensis</i>	8	5	1861		
Calamian deer					
<i>Axis calamianensis</i>	13	6	1990		
Bawean deer					
<i>Axis kuhli</i>	11	6	1993 ¹		
Indian hog deer					
<i>Axis p. porcinus</i>	17	8	1928		
Indochina hog deer					
<i>A. p. annamiticus</i>	7	6	1907		
White-lipped or Thorold's deer					
<i>Cervus albirostris</i>	9	8	1992 ¹		
Visayan deer					
<i>Cervus alfredi</i>	15	6	1923		

	AGE (yrs)	YEAR (mths)	YEAR
Swamp deer or Barasingha <i>Cervus duvauceli</i>	23	0	1929
Red deer <i>Cervus elaphus</i>	26	6	1941
Bactrian red deer <i>C. e. bactrianus</i>	19	10	1980
Barbary red deer <i>C. e. barbarus</i>	16	5	1883
American wapiti <i>C. e. canadensis</i>	26	0	1979
Corsican red deer <i>C. e. corsicanus</i>	13	0	1914
Kashmir red deer <i>C. e. hanglu</i>	19	3	1935
Central European red deer <i>C. e. hippelaphus</i>	18	9	1970
Spanish red deer <i>C. e. hispanicus</i>	15	10	1903
Macneill's deer <i>C. e. macneilli</i>	7	7	1993 ¹
Caucasian red deer <i>C. e. maral</i>	17	11	1929
Tule wapiti <i>C. e. nannodes</i>	13	2	1976
Rocky Mountain wapiti <i>C. e. nelsoni</i>	18	9	1911
Roosevelt's elk or Olympic wapiti <i>C. e. roosevelti</i>	19	5	1993 ¹
British red deer <i>C. e. scoticus</i>	26	8	1954
Altai maral <i>C. e. sibiricus</i>	21	5	1991
Tian Shan wapiti <i>C. e. songaricus</i>	20	9	1918
Tibetan red deer <i>C. e. wallichii</i>	14	5	1926
Manchurian wapiti <i>C. e. xanthopygus</i>	21	1	1938
Manipur brow-antlered or Eld's deer <i>Cervus e. eldi</i>	20	3	1950
Thailand brow-antlered deer <i>C. e. siamensis</i>	19	0	1982 ¹
Burma brow-antlered deer <i>C. e. thamin</i>	16	0	1982
Luzon sambar <i>Cervus m. mariannus</i>	15	0	1919
Japanese sika <i>Cervus nippon</i>	25	5	1936
Dybowski's sika <i>C. n. hortulorum</i>	20	2	1973
Ryukyu sika <i>C. n. keramae</i>	18	1	1969
Chinese sika <i>C. n. mandarinus</i>	7	0	1993 ¹
Indochina sika <i>C. n. pseudaxis</i>	15	8	1981

	AGE (yrs)	YEAR (mths)	YEAR
Taiwan/Formosan sika <i>C. n. taiouanus</i>	21	10	1988
Schomburgk's deer <i>Cervus schomburgki</i>	13	1	1887
Timor deer or Rusa <i>Cervus t. timorensis</i>	21	1	1990 ¹
Sulawesi rusa <i>C. t. macassaricus</i>	3	0	1899
Moluccan rusa <i>C. t. moluccensis</i>	18	2	1894
Javan rusa <i>C. t. russa</i>	17	3	1916
Sambar <i>Cervus unicolor</i>	17	4	1925 ¹
Sri Lankan sambar <i>C. u. unicolor</i>	9	0	1905
Indian sambar <i>C. u. niger</i>	24	5	1928
Bornean sambar <i>C. u. brookei</i>	6	7	1920
Sumatran sambar <i>C. u. equinus</i>	16	1	1940
Malayan sambar <i>C. u. malaccensis</i>	26	5	1955
Formosan sambar <i>C. u. swinhoei</i>	8	3	1875
Père David's deer <i>Elaphurus davidianus</i>	23	3	1980
European moose <i>Alces a. alces</i>	17	11	1968
American moose <i>A. a. americanus</i>	17	2	1938
Northwestern moose <i>A. a. andersoni</i>	15	0	1983 ¹
Alaskan moose <i>A. a. gigas</i>	5	9	1966
Yellowstone moose <i>A. a. shirasi</i>	7	9	1969
Reindeer <i>Rangifer tarandus</i>	20	2	1918
Woodland caribou <i>R. t. caribou</i>	2	4	1902
Alaskan caribou <i>R. t. granti</i>	5	6	1938
Siberian reindeer <i>R. t. sibiricus</i>	13	8	1973
Stone's caribou <i>R. t. stonei</i>	7	11	1966 ¹
Newfoundland caribou <i>R. t. terranova</i>	9	10	1910
Mule or Black-tailed deer <i>Odocoileus hemionus</i>	13	0	1970 ¹
Columbian black-tailed deer <i>O. h. columbianus</i>	11	2	1917
Arizona mule deer <i>O. h. eremicus</i>	15	11	1991
San Diego mule deer <i>O. h. fuliginatus</i>	10	4	1985 ¹

	AGE (yrs)	YEAR (mths)		AGE (yrs)	YEAR (mths)
Alaskan mule deer					
<i>O. h. sitkensis</i>	4	1	1932		
White-tailed deer					
<i>Odocoileus virginianus</i>	15	6	1946		
Acapulco white-tailed deer					
<i>O. v. acapulcensis</i>	4	0	1897		
Northern white-tailed deer					
<i>O. v. borealis</i>	17	6	1922		
Guyana white-tailed deer					
<i>O. v. cariacou</i>	9	0	1956		
Panamanian white-tailed deer					
<i>O. v. chiriquensis</i>	6	11	1922		
Key white-tailed deer					
<i>O. v. clavium</i>	3	5	1973 ¹		
Arizona white-tailed deer					
<i>O. v. couesi</i>	11	0	1911		
Dakota white-tailed deer					
<i>O. v. dacotensis</i>	13	8	1913		
Venezuelan white-tailed deer					
<i>O. v. gymnotis</i>	13	6	1934		
Curacao white-tailed deer					
<i>O. v. margaritae</i>	1	9	1925		
Mexican white-tailed deer					
<i>O. v. mexicanus</i>	12	8	1928		
Florida white-tailed deer					
<i>O. v. osceola</i>	18	6	1921		
Peruvian white-tailed deer					
<i>O. v. peruvianus</i>	11	9	1923		
Sinaloa white-tailed deer					
<i>O. v. sinaloae</i>	14	10	1931		
Texas white-tailed deer					
<i>O. v. texensis</i>	11	11	1927		
Toltec white-tailed deer					
<i>O. v. toltecus</i>	5	4	1910		
Costa Rican white-tailed deer					
<i>O. v. truei</i>	15	4	1942		
Yucatan white-tailed deer					
<i>O. v. yucatanensis</i>	7	9	1943		
Marsh deer					
<i>Blastoceros dichotomus</i>	11	2	1987		
Chaco pampas deer					
<i>Ozotoceros bezoaticus leucogaster</i>	21	1	1989		
Peruvian guemal					
<i>Hippocamelus antisimensis</i>	5	6	1943		
Chilean guemal					
<i>Hippocamelus bisulcus</i>	10	9	1892		
Red brocket					
<i>Mazama americana</i>	13	10	1970		
Costa Rican red brocket					
<i>M. a. cerasina</i>	13	1	1980		
Mexican red brocket					
<i>M. a. temama</i>	14	10	1986		
Red brocket					
<i>M. a. trinitatis</i>	2	0	1922		
St Catherine's red brocket					
<i>M. a. superciliiaris</i>	1	3	1909		
Brown brocket					
<i>Mazama g. gouazoubira</i>	9	6	1953		
Mexican brown brocket					
<i>M. g. pandora</i>	9	8	1983		
Little red brocket					
<i>Mazama rufina</i>	2	0	1906		
Northern pudu					
<i>Pudu mephistophiles</i>	0	6	1972		
Chilean pudu					
<i>Pudu pudu</i>	15	9	1988		
Western roe deer					
<i>Capreolus capreolus</i>	8	9	1993 ¹		
Eastern roe deer					
<i>C. c. pygargus</i>	8	6	1968		
GIRAFFIDAE					
Okapi					
<i>Okapia johnstoni</i>	30	6	1991		
Nubian giraffe					
<i>G. c. camelopardalis</i>	28	0	1906		
Angola giraffe					
<i>G. c. angolensis</i>	16	11	1983		
Kordofan giraffe					
<i>G. c. antiquorum</i>	24	10	1983		
Cape giraffe					
<i>G. c. giraffa</i>	36	2	1973		
West African giraffe					
<i>G. c. peralta</i>	23	10	1968		
Reticulated giraffe					
<i>G. c. reticulata</i>	32	2	1986		
Uganda or Baringo giraffe					
<i>G. c. rothschildi</i>	29	9	1976		
Masai giraffe					
<i>G. c. tippelskirchi</i>	24	2	1979		
ANTILOCAPRIDAE					
Pronghorn					
<i>Antilocapra americana</i>	11	10	1963		
BOVIDAE					
Nyala					
<i>Tragelaphus angasi</i>	15	10	1955		
Mountain nyala					
<i>Tragelaphus buxtoni</i>	11	0	1943		
West African bushbuck					
<i>Tragelaphus s. scriptus</i>	9	3	1930		
Nile bushbuck					
<i>T. s. bor</i>	12	11	1948		
Northern bushbuck					
<i>T. s. decula</i>	7	0	1938		
Lord Delamere's bushbuck					
<i>T. s. delamerei</i>	12	0	1958		
East African bushbuck					
<i>T. s. roualeyni</i>	3	5	1908		
South African bushbuck					
<i>T. s. sylvaticus</i>	12	7	1956		
East African sitatunga					
<i>Tragelaphus s. spekei</i>	16	9	1986		

	AGE (yrs)	YEAR (mths)		AGE (yrs)	YEAR (mths)
Western sitatunga			Forest buffalo		
<i>T. s. gratus</i>	21	6	1983	<i>S. c. nanus</i>	28 6 1977
Zambesi sitatunga			American bison		
<i>T. s. selousi</i>	16	0	1926	<i>Bison b. bison</i>	33 0 1979
Lesser kudu			Wood bison		
<i>Tragelaphus imberbis</i>	13	2	1985	<i>B. b. athabascae</i>	10 7 1993 ¹
Southern lesser kudu			European bison or Wisent		
<i>T. i. australis</i>	16	11	1989	<i>Bison bonasus</i>	26 0 1932
South African greater kudu			Ader's duiker		
<i>Tragelaphus s. strepsiceros</i>	22	3	1988	<i>Cephalophus adersi</i>	4 1 1973
East African greater kudu			Peter's duiker		
<i>T. s. bea</i>	8	7	1955	<i>Cephalophus callipygus</i>	0 7 1951
Somali greater kudu			Bay or Black-backed duiker		
<i>T. s. chora</i>	20	9	1957	<i>Cephalophus dorsalis</i>	12 1 1958
West African bongo			Congo black-backed duiker		
<i>Tragelaphus e. euryceros</i>	9	1	1976	<i>C. d. castaneus</i>	17 1 1969
East African bongo			Jentink's duiker		
<i>T. e. isaaci</i>	19	3	1993 ¹	<i>Cephalophus jentinki</i>	17 6 1992 ¹
Western giant eland			White-bellied duiker		
<i>Taurotragus d. derbianus</i>	15	0	1951	<i>Cephalophus leucogaster</i>	5 4 1954
Eastern giant eland			Maxwell's duiker		
<i>T. d. gigas</i>	16	2	1989	<i>Cephalophus m. maxwelli</i>	12 3 1981
Southern eland			Liberian Maxwell's duiker		
<i>Taurotragus o. oryx</i>	18	8	1875	<i>C. m. liberiensis</i>	2 7 1938
Livingstone's or Zambesi eland			Blue duiker		
<i>T. o. livingstonei</i>	17	4	1939	<i>Cephalophus monticola</i>	9 11 1986
East African eland			Equatorial blue duiker		
<i>T. o. pattersonianus</i>	18	8	1969	<i>C. m. aequatorialis</i>	7 2 1956
Nilgai			Mozambique blue duiker		
<i>Boselaphus tragocamelus</i>	21	8	1939	<i>C. m. hecki</i>	1 9 1899
Four-horned antelope			North Cameroons blue duiker		
<i>Tetracerus quadricornis</i>	10	10	1988	<i>C. m. melanorheus</i>	8 7 1962
Water buffalo (domestic)			South Cameroons blue duiker		
<i>Bubalus arnee</i> (f. <i>bubalis</i>)	28	3	1915	<i>C. m. schultzei</i>	2 5 1932
Lowland anoa			Simpson's blue duiker		
<i>Bubalus depressicornis</i>	36	1	1988	<i>C. m. simpsoni</i>	6 5 1955
Mountain anoa			Zanzibar blue duiker		
<i>Bubalus quarlesi</i>	22	6	1945	<i>C. m. sundevalli</i>	3 8 1904
Indian gaur			Blue duiker hybrid		
<i>Bos g. gaurus</i>	26	2	1930	<i>C. m. aequatorialis</i> × <i>C. m. simpsoni</i>	15 3 1968
Malayan gaur			Natal red duiker		
<i>B. g. hubbacki</i>	2	7	1892	<i>Cephalophus n. natalensis</i>	6 3 1975
Burmese gaur			Mozambique red duiker		
<i>B. g. readei</i>	13	6	1977	<i>C. n. robertsi</i>	2 7 1935
Gayal			Black duiker		
<i>B. g. frontalis</i>	25	4	1927	<i>Cephalophus niger</i>	10 2 1978
Javan banteng			Black-fronted duiker		
<i>Bos j. javanicus</i>	26	7	1990 ¹	<i>Cephalophus nigrifrons</i>	19 8 1960
Burmese banteng			Ogilby's duiker		
<i>B. j. birmanicus</i>	2	0	1931	<i>Cephalophus ogilbyi</i>	0 9 1949
Bornean banteng			Gold Coast Ogilby's duiker		
<i>B. j. lowi</i>	8	3	1935	<i>C. o. brookei</i>	0 5 1909
Yak (domestic)			Red-flanked duiker		
<i>Bos mutus</i> (f. <i>grunniens</i>)	22	3	1904	<i>Cephalophus rufilatus</i>	9 6 1978
Kouprey			Abbott's duiker		
<i>Bos sauveli</i>	2	9	1940	<i>Cephalophus spadix</i>	5 5 1927
Cape buffalo					
<i>Synceros c. caffer</i>	29	6	1974		

	AGE (yrs)	YEAR (mths)	YEAR
Yellow-backed duiker <i>Cephalophus sylvicultor</i>	17	4	1989
Weyns' duiker <i>Cephalophus weynsi</i>	15	3	1964
Banded or Zebra duiker <i>Cephalophus zebra</i>	12	2	1974
Common duiker <i>Sylvicapra g. grimmia</i>	11	10	1936
Abyssinian crowned duiker <i>S. g. abyssinica</i>	14	4	1963
Kaffir crowned duiker <i>S. g. caffra</i>	4	2	1993 ¹
Togo crowned duiker <i>S. g. campbelliae</i>	3	0	1902
Common crowned duiker <i>S. g. coronata</i>	6	4	1910
East Kenya crowned duiker <i>S. g. deserti</i>	12	8	1987
Uganda crowned duiker <i>S. g. lutea</i>	1	7	1955
West Kenya crowned duiker <i>S. g. nyansae</i>	3	5	1954
Chad crowned duiker <i>S. g. pallidior</i>	6	9	1975 ¹
Common waterbuck <i>Kobus e. ellipsiprymnus</i>	17	5	1991
Lake Victoria defassa waterbuck <i>K. e. adolfi-friderici</i>	17	0	1993 ¹
Defassa waterbuck <i>K. e. defassa</i>	19	11	1993 ¹
Senegal waterbuck <i>K. e. unctosus</i>	16	0	1915
Waterbuck hybrid <i>K. e. ellipsiprymnus</i> × <i>K. e. defassa</i>	18	8	1953
Buffon's kob <i>Kobus k. kob</i>	21	11	1970
White-eared kob <i>K. k. leucotis</i>	16	8	1985 ¹
Cameroons kob <i>K. k. loderi</i>	11	2	1914
Uganda kob <i>K. k. thomasi</i>	16	3	1955
Lechwe waterbuck <i>Kobus l. leche</i>	15	1	1929 ¹
Kafue or Red lechwe <i>K. l. kafuensis</i>	18	7	1993 ¹
Nile lechwe <i>Kobus megaceros</i>	18	8	1982
South African greater reedbuck <i>Redunca a. arundinum</i>	16	9	1956
Angolan greater reedbuck <i>R. a. occidentalis</i>	13	11	1972
South African mountain reedbuck <i>Redunca f. fulvorufula</i>	10	0	1985
East African mountain reedbuck <i>R. f. chanleri</i>	12	4	1950

	AGE (yrs)	YEAR (mths)	YEAR
Senegal reedbuck <i>Redunca r. redunca</i>	18	0	1960
Uganda reedbuck <i>R. r. wardi</i>	10	8	1915
Grey rhebok <i>Pelea capreolus</i>	12	4	1986
South African roan antelope <i>Hippotragus e. equinus</i>	14	0	1913
Sudan roan antelope <i>H. e. bakeri</i>	10	6	1910
Angolan roan antelope <i>H. e. cottoni</i>	13	5	1989
Senegal roan antelope <i>H. e. koba</i>	2	4	1910
East African roan antelope <i>H. e. langheldi</i>	17	2	1991
South African sable antelope <i>Hippotragus n. niger</i>	22	3	1990
East African sable antelope <i>H. n. roosevelti</i>	12	1	1955
Scimitar-horned oryx <i>Oryx dammah</i>	20	5	1991
South African oryx or Gemsbok <i>Oryx g. gazella</i>	18	1	1938
Ibeisa beisa oryx <i>O. g. annectens</i>	11	9	1946
Beisa oryx <i>O. g. beisa</i>	19	4	1977
Fringe-eared oryx <i>O. g. callotis</i>	20	0	1984
Arabian oryx <i>Oryx leucoryx</i>	18	1	1991
Addax <i>Addax nasomaculatus</i>	25	8	1990
White-tailed or Black wildebeest <i>Connochaetes gnou</i>	19	7	1962
Brindled gnu or Blue wildebeest <i>Connochaetes t. taurinus</i>	19	11	1940 ¹
White-bearded gnu <i>C. t. albojubatus</i>	21	5	1955
North African hartebeest <i>Alcelaphus b. buselaphus</i>	18	11	1916
Cape hartebeest <i>A. b. caama</i>	15	4	1991
Coke's hartebeest <i>A. b. cokei</i>	13	0	1972
Jackson's hartebeest <i>A. b. jacksoni</i>	11	0	1977
Lelwel hartebeest <i>A. b. lelwel</i>	5	4	1910
Tora hartebeest <i>A. b. tora</i>	11	7	1892
Lichtenstein's hartebeest <i>Alcelaphus lichtensteinii</i>	2	9	1970
Bontebok <i>Damaliscus d. dorcas</i>	15	7	1936
Blesbok <i>D. d. phillipsi</i>	21	8	1983

	AGE (yrs) (mths)	YEAR		AGE (yrs) (mths)	YEAR
Hunter's antelope <i>Damaliscus hunteri</i>	15	2	1989		
Tsessebe <i>Damaliscus l. lunatus</i>	9	4	1940		
Jimela topi <i>D. l. jimela</i>	12	7	1987		
Korrigum topi <i>D. l. korrigum</i>	8	3	1938		
Tiang <i>D. l. tiang</i>	4	10	1930		
Topi <i>D. l. topi</i>	8	3	1938		
Ethiopian klipspringer <i>Oreotragus o. saltatrixoides</i>	12	11	1966		
Masai klipspringer <i>O. o. schillingsi</i>	17	10	1991		
Somali klipspringer <i>O. o. somalicus</i>	10	8	1968		
Zimbabwean klipspringer <i>O. o. stevensoni</i>	4	0	1993 ¹		
Angolan klipspringer <i>O. o. tyleri</i>	0	8	1937		
Kenyan Gunther's dik-dik <i>Madoqua guentheri smithi</i>	10	8	1990		
Kirk's dik-dik <i>Madoqua kirki</i>	14	3	1991 ¹		
Salt's dik-dik <i>Madoqua s. saltiana</i>	2	1	1933		
Red-bellied dik-dik <i>M. s. phillipsi</i>	0	7	1908		
Beira antelope <i>Dorcatragus megalotis</i>	1	1	1956		
Zairean oribi <i>Ourebia ourebi</i> subsp	6	8	1977 ¹		
Cotton's oribi <i>O. o. cottoni</i>	15	10	1984		
Galla oribi <i>O. o. gallarum</i>	1	7	1933		
Ethiopian oribi <i>O. o. montana</i>	13	8	1934		
Senegal oribi <i>O. o. quadriscopa</i>	8	8	1876		
Cape steenbok <i>Raphicerus c. campestris</i>	8	2	1975		
Tanzanian steenbok <i>R. c. neumanni</i>	1	11	1966		
Cape grysbok <i>Raphicerus melanotis</i>	0	4	1913		
Royal antelope <i>Neotragus pygmaeus</i>	6	8	1968		
Zanzibar suni <i>Neotragus m. moschatus</i>	0	<1	1897		
Kenya suni <i>N. m. akeleyi</i>	9	0	1992 ¹		
Zulu suni <i>N. m. zuluensis</i>	13	6	1990 ¹		
Impala <i>Aepyceros melampus</i>	15	4	1990		
Black-faced impala <i>A. m. petersi</i>	2	7	1993 ¹		
Kenya impala <i>A. m. rendilis</i>	17	9	1979		
Tanzanian impala <i>A. m. suara</i>	10	3	1937		
Blackbuck <i>Antilope cervicapra</i>	20	3	1993 ¹		
South African springbok <i>Antidorcas m. marsupialis</i>	19	0	1947		
Angolan springbok <i>A. m. angolensis</i>	15	1	1990		
Southern gerenuk <i>Litocranius w. walleri</i>	11	5	1969		
Northern gerenuk <i>L. w. sclateri</i>	11	5	1990 ¹		
Dibatag <i>Ammodorcas clarkei</i>	3	0	1957		
Arabian gazelle <i>Gazella arabica</i>	11	4	1992 ¹		
Indian gazelle <i>Gazella bennetti</i>	12	4	1950		
Cuvier's or Edmi gazelle <i>Gazella cuvieri</i>	14	10	1993 ¹		
Dama gazelle <i>Gazella d. dama</i>	2	3	1871		
Mhorr gazelle <i>G. d. mhor</i>	14	10	1993 ¹		
Addra or Kordofan gazelle <i>G. d. ruficollis</i>	17	4	1987		
Sudan dorcas gazelle <i>Gazella d. dorcas</i>	17	1	1977		
Amhara or African dorcas gazelle <i>G. d. isabella</i>	15	6	1951		
Saharan dorcas gazelle <i>G. d. neglecta</i>	17	5	1993 ¹		
Muscat gazelle <i>Gazella gazella muscatensis</i>	18	3	1976		
Pelzeln's gazelle <i>G. g. pelzelni</i>	1	0	1932		
Grant's gazelle <i>Gazella granti</i>	12	8	1987		
Roosevelt's gazelle <i>G. g. roosevelti</i>	11	11	1976		
Slender-horned gazelle <i>Gazella leptoceros</i>	12	3	1991		
Senegal red-fronted gazelle <i>Gazella r. rufifrons</i>	13	6	1870		
Cameroons red-fronted gazelle <i>G. r. kanuri</i>	1	0	1907		
Sudan red-fronted gazelle <i>G. r. laevipes</i>	4	0	1993 ¹		
Heuglin's gazelle <i>G. r. tilonura</i>	4	4	1967		
Soemmerring's gazelle <i>Gazella soemmerringi</i>	15	6	1988		

	AGE (yrs)	YEAR (mths)		AGE (yrs)	YEAR (mths)
Speke's gazelle <i>Gazella spekei</i>	12	8	1984	Alpine ibex <i>Capra i. ibex</i>	18 9 1976
Goitred or Persian gazelle <i>Gazella s. subgutturosa</i>	14	9	1948	Kashmir ibex <i>C. i. hemalayanus</i>	4 0 1903
Mongolian gazelle <i>G. s. hillieriana</i>	1	0	1908	Nubian ibex <i>C. i. nubiana</i>	15 2 1940
Saudi goitred or Sand gazelle <i>G. s. marica</i>	15	8	1969	Siberian ibex <i>C. i. sibirica</i>	22 3 1930
Saikik gazelle <i>G. s. yarkandensis</i>	1	10	1906	West Caucasian tur <i>Capra caucasica</i>	19 1 1984
Thomson's gazelle <i>Gazella t. thomsoni</i>	15	2	1992	East Caucasian tur <i>Capra cylindricornis</i>	14 9 1922
Mongalla gazelle <i>G. t. albonotata</i>	9	9	1924 ¹	Spanish ibex <i>Capra pyrenaica</i>	15 2 1921
Mongolian gazelle <i>Procapra gutturosa</i>	7	0	1920	Astor markhor <i>Capra f. falconeri</i>	8 9 1917
Russian saiga <i>Saiga t. tatarica</i>	8	10	1985	Pin Panjal markhor <i>C. f. cashmiriensis</i>	2 5 1916
Red goral <i>Nemorhaedus cranbrookii</i>	18	3	1989	Turkmenian markhor <i>C. f. heptneri</i>	14 0 1975
Kashmir goral <i>Nemorhaedus g. goral</i>	17	7	1898	Suleiman markhor <i>C. f. jerdoni</i>	10 6 1942
Central Chinese goral <i>N. g. arnouxiensis</i>	11	8	1993 ¹	Straight-horned or Kandahar markhor <i>C. f. megaceros</i>	8 0 1915
Western Chinese goral <i>N. g. griseus</i>	17	4	1980	Barbary sheep or Aoudad <i>Ammotragus lervia</i>	21 0 1939
Northern Chinese goral <i>N. g. raddeanus</i>	9	1	1970	Sudan barbary sheep <i>A. l. blainei</i>	2 0 1993 ¹
Japanese serow <i>Capricornis crispus</i>	18	7	1988 ¹	Himalayan bharal <i>Pseudois n. nayaur</i>	16 0 1896
Sumatran or Mainland serow <i>Capricornis sumatraensis</i>	9	10	1941	Chinese bharal <i>P. n. szechuanensis</i>	20 10 1986
Rocky Mountain goat <i>Oreamnos americanus</i>	19	2	1989	Altai argali <i>Ovis a. ammon</i>	6 8 1966
Alpine chamois <i>Rupicapra r. rupicapra</i>	17	2	1967	Kara Tau argali <i>O. a. nigrimontana</i>	15 1 1980
Caucasus chamois <i>R. r. caucasica</i>	5	4	1967	Marco Polo's or Turkestan argali <i>O. a. poloi</i>	11 4 1970
Abruzzo chamois <i>R. r. ornata</i>	0	10	1905	Rocky Mountain bighorn <i>Ovis c. canadensis</i>	15 7 1976
Barren ground musk ox <i>Ovibos m. moschatus</i>	23	4	1992 ¹	Peninsular desert bighorn <i>O. c. cremnobates</i>	8 6 1948
Greenland musk ox <i>O. m. wardi</i>	18	6	1981	Nelson's desert bighorn <i>O. c. nelsoni</i>	15 1 1962
Mishmi takin <i>Budorcas t. taxicolor</i>	19	7	1986	Dall's sheep <i>Ovis d. dalli</i>	15 7 1991
Golden takin <i>B. t. bedfordi</i>	0	6	1993 ¹	Stone's sheep <i>O. d. stonei</i>	13 10 1992
Szechwan takin <i>B. t. tibetana</i>	5	9	1993 ¹	Kamchatkan snow sheep <i>Ovis n. nivicola</i>	3 0 1993 ¹
Nilgiri tahr <i>Hemitragus hylocrius</i>	17	3	1935	Transcaspian ural <i>Ovis orientalis arkal</i>	6 11 1904
Himalayan tahr <i>Hemitragus jemlahicus</i>	21	9	1963	Afghanistan/Iranian ural <i>O. o. cycloceros</i>	12 9 1993 ¹
Persian wild goat <i>Capra a. aegagrus</i>	9	2	1917	Armenian mouflon <i>O. o. gmelini</i>	13 8 1993 ¹
Cretan wild goat <i>C. a. cretica</i>	20	9	1934		

