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BULLETIN
OF THE
AMERICAN MUSEUM OF NATURAL HISTORY
VOLUME 179 : ARTICLE 2 NEW YORK : 1985

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BULLETIN OF THE AMERICAN MUSEUM OF NATURAL HISTORY
Volume 179, article 2, pages 197–288, figures 1–16, tables 1–8
Issued April 19, 1985
Price: $9.50 a copy

 ISSN 0003-0090

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ABSTRACT

This study examines two factors which affect the dimensions of the postcranial skeleton of Bovidae: physical constraints of increasing size and adaptations to particular habitats or modes of locomotion. Total limb lengths, lengths of proximal bones, diameters, and areas of long bones all scale more or less predictably with body size. All lengths scale with negative allometry, whereas areas and diameters vary from slightly negative to positive, depending on the bone. Comparisons of exponents of the scaling relationships to expectations of geometric and elastic scaling theory show that bovids do not scale geometrically, and in some dimensions seem to scale elastically. However, elastic factors cannot be the sole physical constraint governing scaling since many dimensions differ significantly from elastic theory. In addition, some limb elements show changes in gross morphology which violate the assumptions of elastic theory. Lengths of radius, metacarpal, and metatarsal do not scale predictably with body weight; adaptations to particular habitats are more important in determining lengths of these bones than is body size. Species found in open or grasslands habitats tend to have long limb elements relative to body weight, those in mountainous regions have relatively short limb elements, and those in woodland regions have intermediate length distal elements.

INTRODUCTION

Dimensions and proportions of the skeleton differ among related animals of different sizes, as has been shown for many groups of both vertebrates and invertebrates (see Gould, 1966 for examples). As Gould (1975) has pointed out, orderly allometry is almost the rule in interspecific plots over a wide size range while geometric similarity is rare. In order to maintain functional equivalence over a wide size range, adjustments in shape must occur. Such changes differ in detail among various groups depending on the mechanical, functional, or physiological needs of the group. Differences of form may also occur independent of absolute size; these are adaptive changes related to habitat. A complete understanding of changing dimensions in any group requires the separation of these two factors. This study examines scaling relationships in the artiodactyl family Bovidae with several objectives. First, I define the postcranial scaling relationships of a number of dimensions of the skeleton of Bovidae and identify those changes which are strictly size-related. Second, I evaluate some of the principles and mechanical constraints which have been suggested to govern size-related changes. Third, I consider the effect of adaptive or habitat-related changes in determining limb dimensions and their effects on scaling relationships.

MATERIALS AND METHODS

The specimens used in this study are from the collections of the American Museum of Natural History (AMNH), the United States National Museum of Natural History, Smithsonian Institution (NMNH), the Museum of Comparative Zoology, Harvard University (MCZ), the Field Museum of Natural History (FMNH), the Peabody Museum of Natural History, Yale University (YPM), and the British Museum of Natural History (BMNH). Museum numbers and locality data for all specimens are given in Appendix 1. Summary statistics for each species are given in Appendix 2, and the raw data are given in Scott (1979).

For most of the analyses done in this study the species was the basic unit. However, if there was a weight difference of more than 10 percent between the sexes or subspecies, individuals of a species have been separated by sex and subspecies for all analyses which included body weight as a factor. The specimens included represent 108 species of the family Bovidae, as listed in Appendix 1.

All species used were adult individuals (as indicated by epiphyseal fusion) that showed no signs of gross deformity. No zoo-raised individuals were included in this study unless the only available specimen was a zoo animal

(*Pelea capreolus, Bison bonasus,* and *Gazella dama*). Animals that had been captured as adults or were kept on game preserves were included if the sample size for that species was small. Skinner (1942), studying *Antilocapra,* found that game-preserve animals differed little in limb measurements from wild animals, but that zoo animals varied significantly. The differences in zoo animals are not merely statistical: many of the skeletons had a porous or chalky quality which distinguished them from wild species. This quality was not present in the preserve animals.

Measurements were taken on the left side unless some element of that side was missing or broken, in which case the elements of the right side were used. All measurements of limb bone lengths under 10 cm were made with a Mitutoyo dial caliper to the nearest 0.01 cm; other limb lengths were taken with a GPM anthropometer to the nearest 0.1 cm. All measures on articular surfaces and of diameters were taken to the nearest 0.01 cm. Measurements were retaken on a number of specimens; these were not different from the first measurements.

For each long bone (humerus, radius, metacarpal, femur, tibia, and metatarsal) length, and antero-posterior and transverse diameters at midshaft and at several articular surfaces were measured. Midshaft was located by dividing the length measurement in half and measuring this distance from the proximal end. The antero-posterior diameter was measured from the most anterior to the most posterior point as the bone would be positioned in the living animal. Transverse diameter was measured at right angles to this. All length measurements of long bones were chosen to represent the greatest length of the bone between articular surfaces, not greatest length. No attempt was made to estimate the center of rotation of the joint. Although distance from center of rotation to center of rotation would be a better measure of changes in relative limb lengths, that distance is difficult to estimate in disarticulated skeletal material. The difference between that measurement and the one actually made would be small. The exact points between which measurements were taken were chosen so as to make the measure easily repeatable and applicable to all bovids. All measurements were made between the points indicated in figure 1, and with the calipers held parallel to the long axis of the bone.

Additional measurements taken are illustrated in figure 1. These include antero-posterior and transverse diameters measured at proximal (MC2, MC3; MT2, MT3) and distal ends (MC4, MC5; MT4, MT5) of the metapodials and at the distal end of the tibia (T4, T5). The transverse and antero-posterior diameters of each bone taken at midshaft were used to calculate the area of the bone at the midshaft cross section. This area was calculated as though the cross section of the bone were an ellipse with major and minor axes equal to the antero-posterior and transverse diameters. This does not give an exact estimate because it does not take into account size of the marrow cavity. However, the external diameters of the bone provide a sufficiently accurate estimate for this study. I also calculated areas as if the bones were rectangles with sides equal to the antero-posterior and transverse diameters. The exponents were the same in each case.

Allometric equations of the form $y = mx^b$ were fitted to the data by doing a least squares analysis on the logarithmic transformation of the data, using programs in the Statistical Analysis Systems library. Calculations of 95 percent confidence intervals were as described in Simpson, Roe, and Lewontin (1960). All regressions of length versus diameter were calculated based on the 560 individual specimens. Regressions involving body weight calculations were based on the mean of the individual measurements and an average adult weight for the species (see Scott, 1979 for discussion). If the species is sexually dimorphic, or the subspecies vary among themselves in body weight the sexes or subspecies are considered separately.

Ratios of transverse to antero-posterior diameter were calculated for each long bone at midshaft. Regressions of the ratios versus weight were calculated, and plots of the ratios and the residuals were analyzed to check for regular correlation of shape change with size or with habitat.

In order to establish whether different methods of taking measurements and obtaining body weights seriously affects results I recalculated a number of the regressions

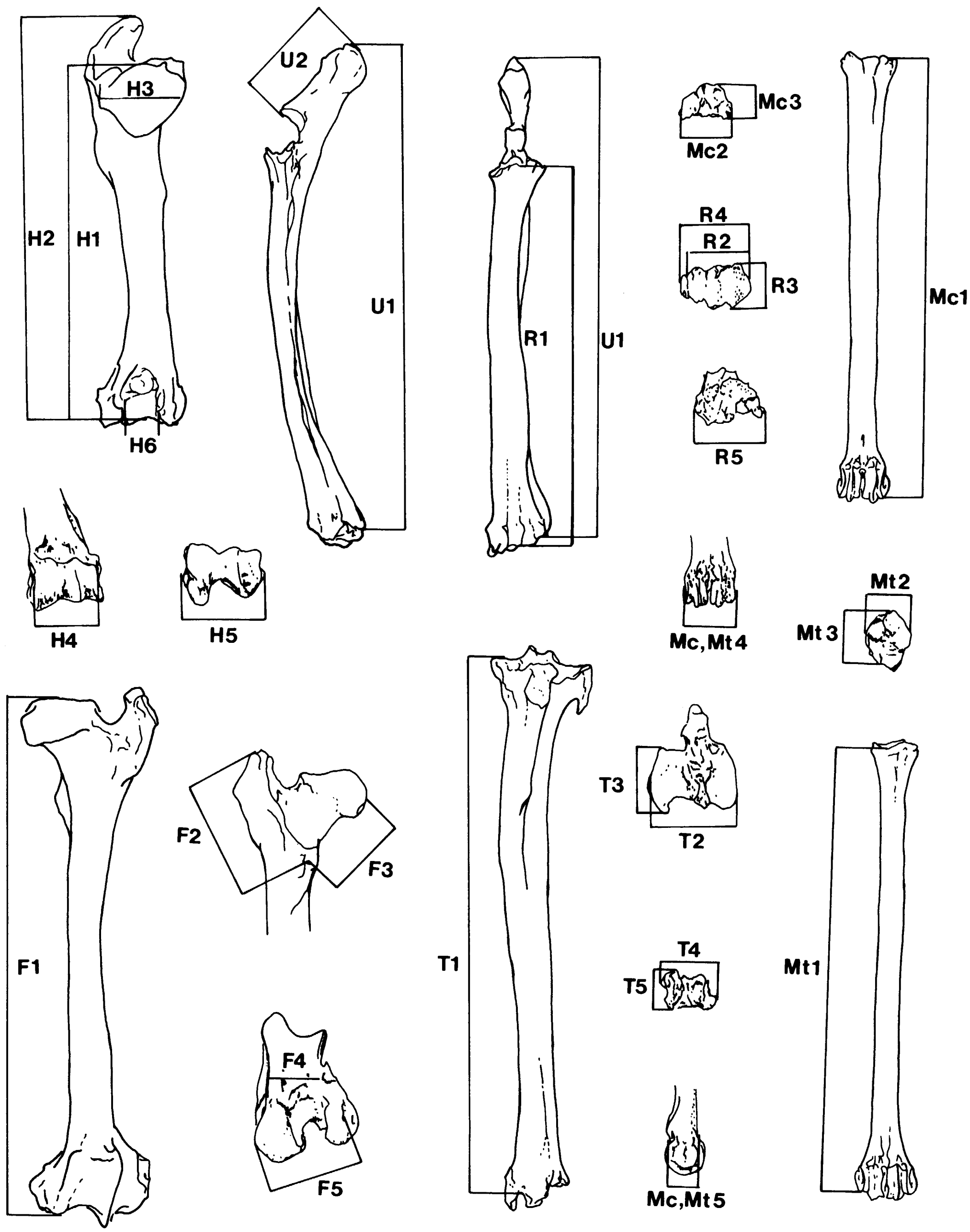

FIG. 1. Measurements analyzed in this study. Reprinted with permission of the Linnean Society.

using only that subset of my data which corresponds to the species measured by Alexander (1977).

In order to determine whether habitat-related changes distort allometric scaling trends, the bovid species were divided into habitat groups. The species within each category are found in grossly similar habitats and exhibit similar behavioral and feeding patterns. These groupings are oversimplified and may contain species which are dissimilar in some ways. However, the purpose of this part of the analysis is to determine whether habitat differences do distort scaling trends in some bones, and if so, in what directions. A more detailed analysis of habitat differences and related limb variation will be presented elsewhere. The categories have been described in detail in Scott (1979) and for the purposes of this study a brief summary will suffice. The group in which each species is placed is given in Appendix 1. The groups according to habitat are: Group 1) flat, open grasslands or arid areas; Group 2) mixed woodland and open areas; Group 3) heavy forest; Group 4) true mountainous habitat; and Group 5) rolling hill country. In most cases all species of a tribe fit into one category, so that in some cases tribes were used to analyze scatter. This is particularly true where tribes show different adaptations to the same habitat, as for example, for Cephalophini and Neotragini in forest habitats.

Groups 1 through 5 are coded in the figures by symbols. The influence of habitat was judged visually. I have not analyzed scaling relationships within groups in detail because most of the groups include either too few species or too small a size range to give accurate results. For Groups 1, 2, and 4 which include a large number of species I have given separate exponents for scaling relationships of metapodial lengths to weight.

ACKNOWLEDGMENTS

I thank Dr. V. L. Roth, Dr. J. D. Archibald, Dr. K. S. Thomson, Dr. T. Grand, Dr. R. Thorington, Dr. L. Marcus, and Dr. J. A. W. Kirsch for critically reading and commenting on this manuscript, and Dr. T. McMahon and Mr. S. Katz for many helpful comments and discussions during the course of this work. Many curators and assistants provided access to collections and assistance; their help is gratefully acknowledged. The investigations of shape change and scaling of diameters and areas were supported by a grant from the Rutgers Research Council and by computer funds from the Center for Computer and Information Services. Other portions of this study were part of a doctoral dissertation submitted to the faculty of Yale University and were supported by a graduate fellowship from Yale University.

THEORIES OF SCALING RELATIONSHIPS

Most discussions of size-related changes point out that in a geometrically similar series of animals weight (volume) increases as the cube of any length, whereas cross-sectional area of long bones increases as the square of linear dimensions. Since the compressive strength of bone and hence its weight bearing ability is related to its cross-sectional area, it is to be expected that the bones of large animals would be relatively thicker than those of smaller animals. However, though it is clear that the bones of an animal must be strong enough to bear its weight, Gould (1966) points out that area and hence compressive strength rarely scales as body weight. Rather, areas are more slender than would be expected if they scaled directly as body weight. Small animals would seem to maintain a greater margin of safety in terms of compressive strength than do large animals.

It is obvious that the limitations of compressive strength cannot explain known scaling relationships. McMahon proposed that body proportions of length and diameter are determined by the elastic properties of the material from which they are constructed. This elastic similarity model was first developed to apply to the length and diameter relationships of trees (McMahon, 1973, 1976) and has been generalized to vertebrates, especially ungulates (1975a, 1975b, 1977). The central premise of the theory of elastic similarity as it applies to the locomotor system is that bending forces are the main threat to structural integrity, and that as size increases dimensions change to maintain equal bending forces in species of different sizes. Elastic theory assumes that elastic properties of biological material are the single important factor determining dimensional relationships. In biological terms it seems more plausible that more than one factor would influence body proportions. Elastic properties may be one of these factors; they may play a major or a minor role.

Elastic theory has been applied to bovids as well as other ungulates but all of its implications and assumptions do not seem to be well understood. For this reason I review them here. McMahon used the term "elastic" (as I will) in the sense that engineers use the term. That is, elastic refers to the behavior of a linearly elastic or Hookerian material, one in which the produced strain is linearly proportional to the applied stress. (See Wainwright et al., 1967 for a more detailed discussion of these materials.) If an elastic column or cylinder (a reasonable first approximation to the shaft of a long bone) is loaded from above with some weight, the applied stress and resultant strain are said to be compressive. If the column is short and the weight is applied along its central axis, only compressive stress (and strain) will be generated. If we load a tall, slender cylinder other factors will become important: any deviation (eccentricity) of the load from the central axis will create a bending moment, tending to bend or buckle the column. While a short, thick column will fail only because of compressive failure, a long, slender column will in most cases fail because of buckling before it will fail because of compressive failure (Petersen, 1969). Buckling or bending thus may be a greater threat to skeletal integrity than compressive failure because of the shape of long bones.

A cylinder or bone subjected to bending stress undergoes compressive stress on one side and tensile stress on the other. Frost (1973) has suggested that bones are designed so that they are primarily loaded in compression since bone has less tensile than compressive strength. However, Lanyon (1980) reports that recordings from the bones of several species show that they undergo bending stresses even during normal slow locomotion. Fractures usually begin on the side of a bone which is undergoing tensile stress (Burstein et al., 1972, quoted in Wainwright et al., 1967). "Even when a long bone is loaded in compression the failure is often a tensile one because the bending moment produced is more important than the net compression" (Currey, writing in Wainwright et al., 1967). Thus, bending moments are important because such moments act to cause breakage. McMahon recognized the importance of bending forces and postulated that maintenance of equal resistance to bending (and consequent breakage) defines allometric trends in all animals.

Factors that determine elastic resistance to bending of a cylinder are the nature of the material, its density, and the shape of the object. The length of a cylinder at which the threat of buckling becomes critical is related to its midpoint diameter by:

$$l = C(E/p)^{2/3}d$$

where l is the length of the cylinder, d is its diameter, C is a constant, p is the weight per unit volume, and E is the elastic modulus (a measure of the stiffness or resistance to bending). Elastic similarity theory predicts that as animals of the same basic body plan become larger their dimensions will change so that their body parts maintain the same elastic resistance to bending forces, that is, length will scale as diameter to the two-thirds power. It is of course true that body parts are not simple cylinders, but elastic relationships can apply to cases where the weight is distributed over the column, to a hollow cylinder, or to a tapering column by a change in the constant; thus, the exact shape of the series of objects is not critical. A variety of forces will act on any given skeletal element, depending on whether the animal is at rest or moving; these include a complicated set of bending, buckling, and torsional loads. The elastic criteria predict the same relationship between length and diameter in each case (McMahon, 1973). The predicted values for dimensions of animals for each relationship, according to McMahon (1973, 1975a), are given in table 2; for comparison I have included the values predicted for a geometrically similar series of animals.

Two assumptions of elastic theory should be recognized. First, in an elastic series of animals, the weight of the skeleton must be isometric with body weight and second, each bone must have the "same shape" throughout the series. Application of elastic criteria would change if either of these assumptions were violated. If a nonisometric relationship exists between skeletal weight and body weight the value of "p" in the length and diameter equation would no longer be a constant, but if skeletal weight changes predictably with body weight the equation can be recalculated to take this into account, with a resultant difference in predictions (McMahon, personal commun.). Violations of the second condition may be more problematic. In order to satisfy the requirements of "same shape" in elastic terms the cross section of a given bone should have the same geometric form in all members of an elastic series; all should be circular or square, or some other uniform shape. If cross-sectional shape changes, the elastic formula cited above does not apply. Although elastic theory can predict dimensions for a series of long, slender objects of any geometric shape, the shape must remain constant. In fact, this study provides evidence that some shape changes in long bones do occur.

Maloiy et al. (1979) have raised theoretical objections to elastic scaling on the grounds that: 1) dynamic factors are most important in determining skeletal dimensions, not static forces; and 2) small animals place higher multiples of body weight on each limb than do larger animals when running. The first objection is unfounded since elastic factors predict the same relationships for moving versus static loads (McMahon, 1973). The second, however, may affect scaling relationships in an elastic series. If large species place relatively less stress on their limbs, then areas and diameters would not increase as rapidly as elastic theory would predict, that is, the exponents would be less than elastic predictions.

SCALING STUDIES IN UNGULATES

Very few studies have been done on scaling relationships of ungulates. Radinsky (1978) has used body length scaling relationships in carnivores and ungulates to predict body weight of fossil species, and Jerison (1971, 1973) has used body lengths and limb lengths of camelids in similar ways. The most comprehensive studies of ungulate scaling have been directed toward testing the elastic similarity theory. McMahon tested his predictions by assembling data on the length to diameter relationships of 118 individuals of 95 species of the orders Artiodactyla and Perissodactyla (McMahon, 1975a). His results support the theory of elastic similarity, although the goodness of fit varies both with the bone and the taxonomic group in question. Best fits are obtained for humerus and femur, and for the family Bovidae considered separately, and for all Artiodactyla considered together. The exponents obtained for relationships of more distal bones and for all limb bones when both ungulate orders (Artiodactyla and Perissodactyla) are included differ widely from elastic predictions and correlation coefficients are lower.

Alexander (1977) tested elastic theory by deriving allometric equations for a number of body dimensions of several species of Bovidae. Using data from Sachs (1967), Alexander calculated the exponents for three linear dimensions versus body weight: body length, shoulder height, and hind height (height at the hip). These data show close agreement with the values predicted by the elastic theory, that is, that lengths should scale as body weight to the 0.25 power. In each case 0.25 is within the 95 percent confidence limit of the experimental exponent, but the exponent expected if the animals were geometrically similar (0.33) lies outside the confidence intervals. Allometric equations based on measurements taken on eight specimens of adult antelopes belonging to seven species (*Oryx beisa, Connochaetes taurinus, Alcelaphus buselaphus, Gazella granti, Litocranius walleri, Gazella thomsoni,* and two *Madoqua kirki*) for bone lengths versus body weights are close to those predicted by elastic criteria for all bones except the ulna. The predictions for bone diameters versus weight are (with the exception of humerus) lower than expected, although the exponent predicted by elastic theory, 0.375, lies within the confidence limits for each bone except tibia.

The studies of McMahon and Alexander provide important data on some of the scaling relationships in ungulates. However, both studies raise further questions. First, what are the scaling relationships of the family Bovidae when all or most species of the family are included, and are the results of scaling studies dependent on the subset of species chosen? Second, do these scaling relationships conform to either the predictions of geometric or elastic scaling? Third, do bovids as a group really meet the assumptions of the elastic theory? Fourth, why do distal bones scale less predictably with body weight than proximal bones?

STUDIES OF HABITAT-RELATED EFFECTS

A broader question which neither McMahon nor Alexander considers is the possible role of adaptive factors in determining limb dimensions and deviations from regular scaling relationships. Variation in the relative lengths of long bones has been discussed by several authors in relation to lever mechanics and mode of locomotion. Hildebrand (1959, 1962) and Smith and Savage (1956) have described basic cursorial adaptations. Howell (1944) and Gambaryan (1974) both have pointed out that there are differences in limb proportions between animals of different habitats and locomotor habits. Many of these authors used ratios (notably Howell) which were not controlled for body size, and thus did not completely separate the effects of size from those of habitat. These studies have, however, pointed out the influence of habitat in determining limb characteristics.

Adaptations of long bone length to habitat provide a possible explanation for the striking and significant variability in distal bone lengths. McMahon merely states: "Evolution has apparently produced more diversity in length among distal bones of a given diameter than among proximal bones" (McMahon, 1975a, pp. 551, 553). He does not propose an explanation for the magnitudes or direction of the variability, although he does suggest a mechanism for the greater variability of distal versus proximal bones. Since he considers the whole limb to function as a single loaded beam, he believes that the greatest bending forces would be located proximally. But, limbs are jointed and cannot be considered to function as a single unit. Even if this factor were sufficient to explain why distal bones potentially may be more variable, it does not explain why they are more variable. Habitat-related changes may provide this explanation.

RESULTS AND DISCUSSION

INFLUENCE OF METHODOLOGY ON RESULTS

There are two approaches to comparing body weight to length and diameter dimensions. One can use the actual measurements and body weights of individual animals, or data can be pooled from various sources. Alexander (1977) has used what is theoretically probably the more desirable approach: comparing body weight and limb measurements of a series of individuals. However, there are several problems with this approach. First, it is difficult to obtain specimens and sample sizes are likely to be very small: Alexander's results are based on eight specimens. Second, there are problems involved in using one-time weights of wild animals, because the investigator cannot control such variables as time of collection, degree of fill of the digestive tract, or hydration. This type of sampling error may compound errors due to small sample size. It should also be noted here that Alexander's data are not field weights of the entire animal but estimates based on actual eviscerated weights and weights of full digestive tracts and other internal offal estimated from values in Ledger, Sachs, and Smith (1967) and Ledger and Smith (1964).

Large samples of bones can most easily be obtained from museum collections but these seldom have field data on body weight. Yet body weight data are available for most bovid species, especially those from Africa. Since both linear measurements and body weight are subject to individual variation (even within the confines of a sex or subspecies), it seems reasonable to use an average of each to represent the species. Probably the ideal data for comparisons of body weight and linear dimensions would be based on averages from a single population, as are the data of Sachs (1967). Data of this kind would eliminate problems related to using one-time weights of wild animals and problems related to geographic variation in size. However, these kinds of data are available for only a limited set of measurements on a few species.

The exponents I obtained are compared with Alexander's results in table 1. Different methods of weight estimation do not significantly affect the results of allometric regressions. Despite differences in method of weight estimation and data collection, my results are comparable with those obtained by Alexander particularly for lengths and diameters of proximal bones, but less so for length to weight relationships of metapodials. However, all my values lie within the confidence intervals of Alexander's exponents. The proximal bones, which scale most closely with weight, are similar in the two studies, although the metapodials, which show less close scaling relationships, differ. The differences may result from differences in the way measurements are taken. Alexander does not describe the points between which he measured metapodials, so I cannot evaluate this possibility. In general, these results indicate that measurements on museum specimens can be combined with average weights without seriously biasing results.

TABLE 1
Comparison of Exponents Calculated for this Study with Those of Alexander (1977)[a]

	Alexander	This Study
	Length to Body Weight	
Humerus	.2766 ± .0216	.262 ± .060
Ulna	.3129 ± .0319	.310 ± .057
Radius	.3053 ± .0394	–
Metacarpal	.1853 ± .1029	.255 ± .132
Femur	.2580 ± .0175	.263 ± .039
Tibia	.2095 ± .0288	.233 ± .035
Metatarsal	.1914 ± .0716	.252 ± .080
	Anteroposterior Diameter to Body Weight	
Humerus	.3865 ± .0326	.381 ± .030
Radius	.3696 ± .0167	–
Metacarpal	.3386 ± .0342	.355 ± .046
Femur	.3577 ± .0266	.330 ± .068
Tibia	.3016 ± .0161	.309 ± .065
Metatarsal	.3080 ± .0311	.337 ± .068

[a] Exponent ± 95% confidence interval is given for the scaling relationship of length and anteroposterior diameter of each long bone to body weight.

SHAPE CHANGES IN LONG BONES

Shape changes in long bone shafts are of interest in two respects. First, the nature of the changes may indicate functional differences related to size or habitat. If shape changes in some regular way with size, it suggests that animals are exposed to different or disproportionately greater or lesser stresses as size increases. Nonsize correlated changes may indicate habitat related mechanical differences. Second, changes in the geometry of cross sections indicate that a series of bones cannot be an elastic series. Although long bones of bovids differ in many small details of morphology, only changes in the geometry of the cross section should preclude application of the elastic theory. Since all diameters in an elastic series scale with the same exponent (0.375) the ratio of antero-posterior to transverse diameters should be constant.

The calculated ratios of transverse to antero-posterior diameters are given in table 2. There is variation in shape for all long bones although this is most pronounced for metapodials (fig. 2, metacarpal ratios plotted against weight), and to a lesser degree for the tibia; the femur (fig. 3) shows the least variation. Interpretation of the variation in humerus, femur, and tibia is somewhat difficult since raised muscle scars are sometimes included in the diameters, especially in males of the larger species. The distal extension of the deltoid tuberosity of the humerus, the muscular line of the tibia, and the lateral supracondyloid tuberosity of the femur increase the antero-posterior diameters in some species and may distort the ratios. Muscle scars are more variable than other dimensions, especially in large species and those which show marked sexual dimorphism. This complicates interpretation of results.

The nature of the shape changes can be used to identify some of the factors which govern those changes. All but two of the ratios show a significant difference from zero slope at the 0.01 level or greater, but the percentage of variation explained by the regressions is low. The greatest amount of variation explained is for tibia and metacarpal. Size may thus be a contributing factor in shape change in the metacarpal and tibia. In these bones the transverse diameter increases relative to weight as species become larger. Only in the metapodials is there any correspon-

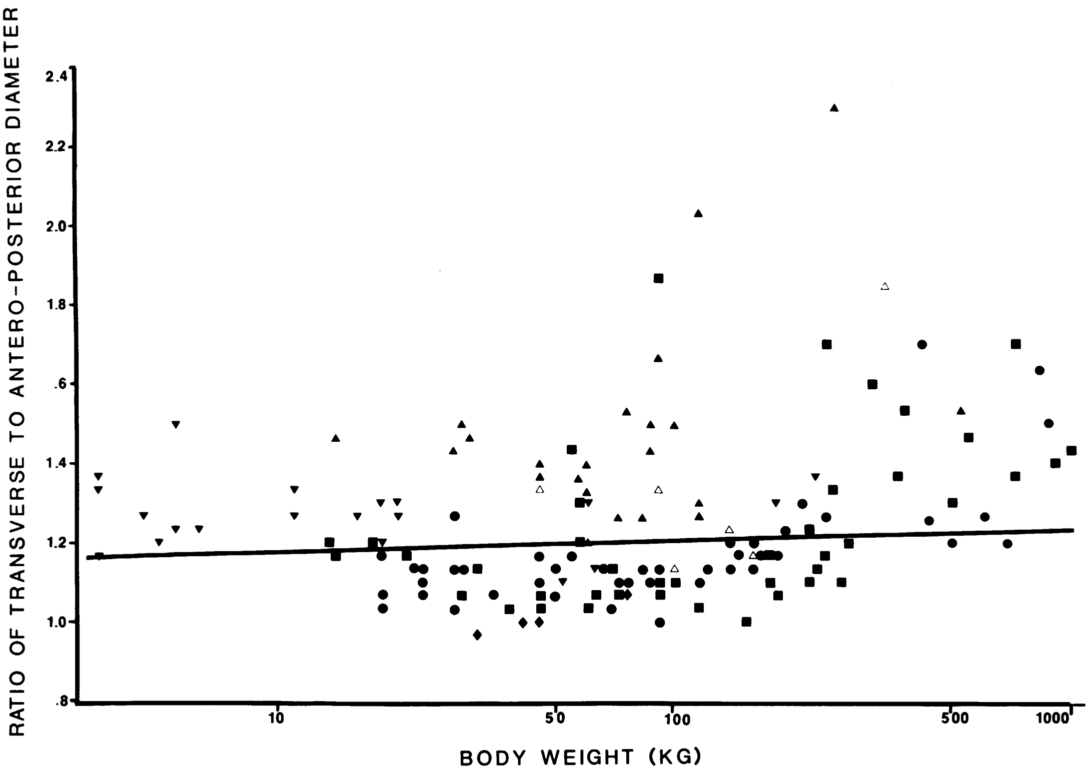

FIG. 2. Ratio of transverse to antero-posterior diameter of metacarpal plotted against the logarithm of body weight. Symbols represent habitat groups as follows: ● = Group 1; ■ = Group 2; ▼ = Group 3; ▲ = Group 4; △ = Group 5; ◆ = *Litocranius walleri, Ammodorcas clarkei,* and *Gazella dama.*

dence between habitat and midshaft ratio. All the species which inhabit cliffs and rugged mountain terrain, as well as the large bovids, show flattened, transversely expanded metapodials. Although the variation in the tibia could be attributed to the inclusion of muscle scars in measurements, this cannot be the case for metapodials. Thus, I believe that metapodial cross section ratios represent a real habitat-related change in bone shape.

Increasing the transverse diameter of a bone decreases its tendency to bend laterally, indicating that lateral forces are greater in those groups with flattened metapodials. This is certainly not unlikely in rock-climbing bovids, where the animals may not always be able to jump and land with the legs squarely under the body. Scaling relationships of transverse diameters show that relatively larger lateral forces are generated in large rather than in small bovids: transverse diameters increase more rapidly with body weight than do antero-posterior diameters, especially at the distal end of the bone. When transverse diameters taken at the proximal articular surface, midshaft, and distal articular surfaces of metapodials and tibia are scaled with body weight the exponents of these relationships increase from proximal to distal (table 6). The exponents of the proximal and distal ends are significantly different from each other. Metapodials thus increase in width more rapidly with size at their distal than proximal ends. For antero-posterior diameters (table 5) none of the exponents are significantly different from each other at the 0.05 level; that is, antero-posterior dimensions have the same relationships to weight at each point along a bone. These differences indicate that transverse stresses on the distal ends of bones increase with increasing size. In fact, even in narrow-bodied ungulates the limbs are eccentrically loaded; that is, the limbs are lateral to the main mass of body weight. As

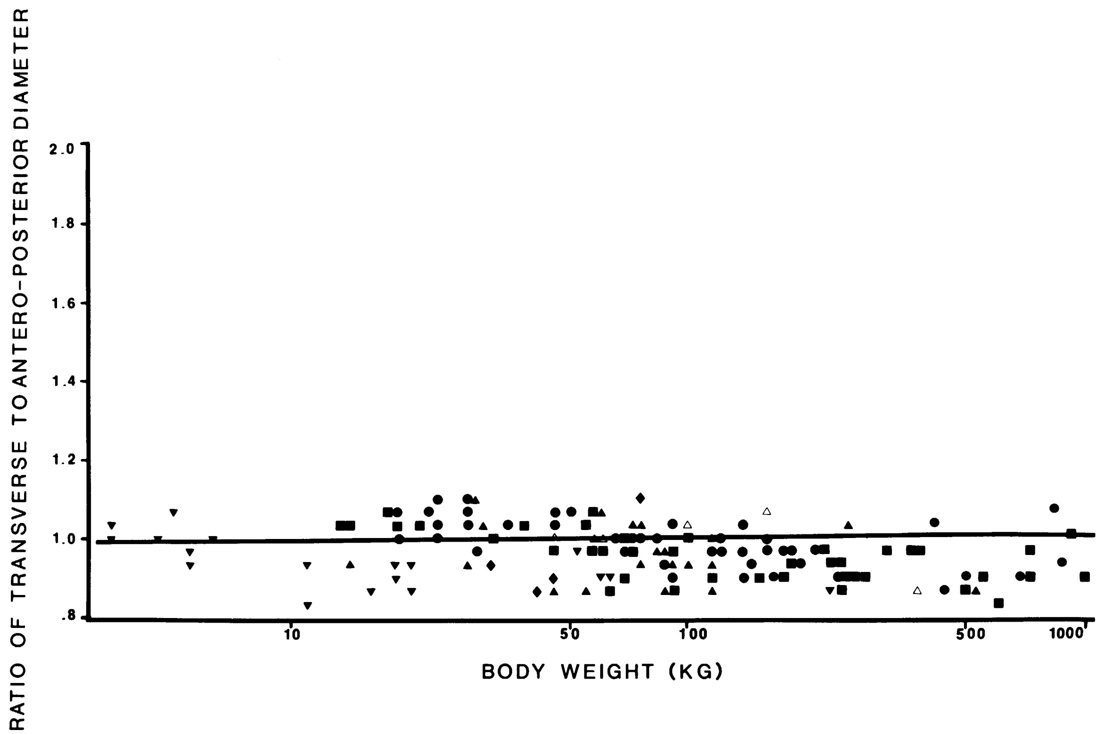

FIG. 3. Ratio of transverse to antero-posterior diameter of femur plotted against the logarithm of body weight. Symbols as in figure 2.

size increases this may increase the bending stresses in the transverse direction, accounting for the transverse thickening at the distal ends of bones.

McMahon has stated (personal commun.) that the antero-posterior dimension is more critical with respect to bending forces: studies of animals moving across force plates show that forces in the limb are generated in the parasagittal plane. However, this may not always be the case in an animal running in the field: during turns a running animal might well generate lateral forces on its limbs. McMahon has suggested (personal commun.) that the widening of the metapodials may be a secondary result of widening the articular surfaces as a stabilizing mechanism. This again implies that lateral forces are greater in these animals than in those in which the cross sections of the metapodials more closely approximate a square.

It is difficult to say what degree of variation

TABLE 2
Ratios of Transverse to Anteroposterior Diameters at Midshaft[a]

	Range	Exponent	Probability	R^2
Humerus	0.69–0.96	.00003	.185	0.011
Radius	1.36–2.00	−.00008	.088	0.019
Metacarpal	0.96–2.24	.00038	.0001	0.118
Femur	0.80–1.20	−.00011	.002	0.062
Tibia	0.96–1.44	.00018	.00001	0.143
Metatarsal	0.72–1.68	.00014	.012	0.041

[a] For each long bone range of ratios, exponent, probability that the exponent differs from zero, and the R-square value are given.

TABLE 3
Scaling Relationships of Long Bone Lengths Versus Body Weight[a]

Bone	Exponent	Constant	Correlation Coefficient	Elastic?
Scapula	.3477 ± .0132	04.69	.833	no, barely
Humerus	.2665 ± .0116	05.54	.811	yes
Radius	.2599 ± .0180	06.59	.680	yes
Metacarpal	.1855 ± .0314	07.86	.372	no
Forelimb	.2386 ± .0171	19.90	.677	yes
Femur	.2592 ± .0144	07.71	.811	yes
Tibia	.2086 ± .0144	10.80	.677	no
Metatarsal	.1752 ± .0258	08.81	.473	no
Hindlimb	.2160 ± .0139	27.30	.704	no
Forelimb ± scapula	.2617 ± .0164	25.10	.769	yes
Body length	.2686 ± .0207	32.80	.885	yes
Thoracic circumference	.3690 ± .0022	19.90	.925	no, barely

[a] Table gives exponent ± 95% confidence interval, regression constant, and correlation coefficient. All correlation coefficients are significant at the .001 level. Last column indicates whether the exponent predicted by elastic theory (.25) lies within the 95% confidence interval of the exponent.

precludes application of elastic theory. Much of the limited variation in femoral shape can probably be attributed to individual variation in muscle scar size; femur shape certainly does not seem to violate elastic theory. Similar statements can be made for humerus and radius. Metapodials show the most variation; I believe that the range of cross-sectional shapes is too great for these bones to be considered a potential elastic series. The tibia is most problematical. It varies less than the metapodials but more than the other long bones and should be used with caution in drawing conclusions about elastic scaling.

The metapodials and possibly the tibia thus do not form an elastic series throughout the

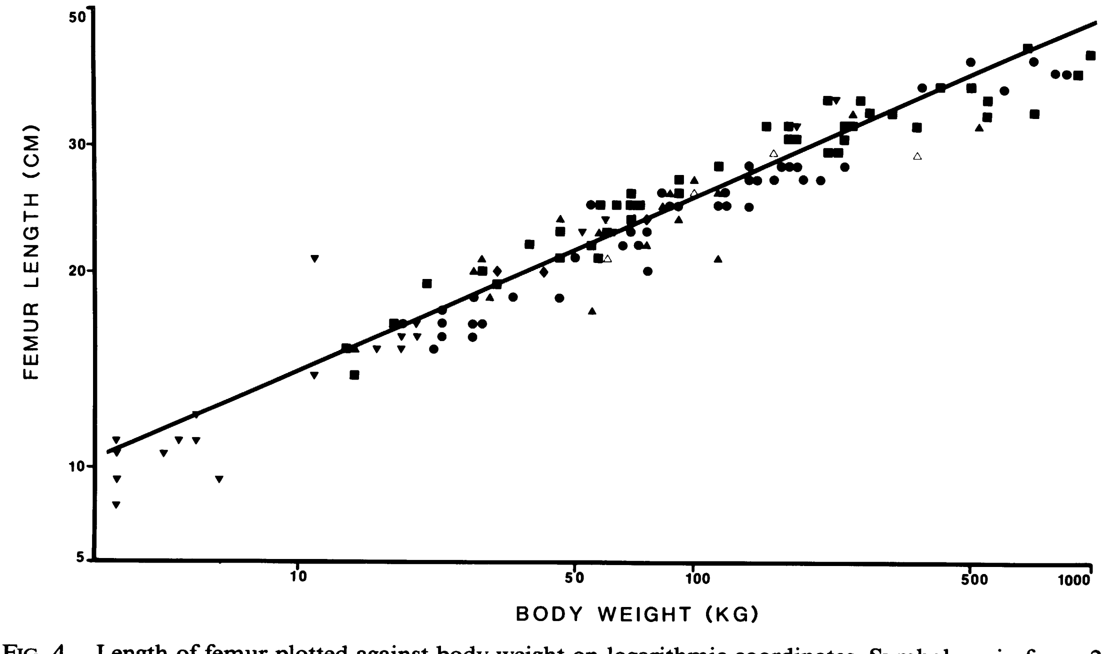

FIG. 4. Length of femur plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

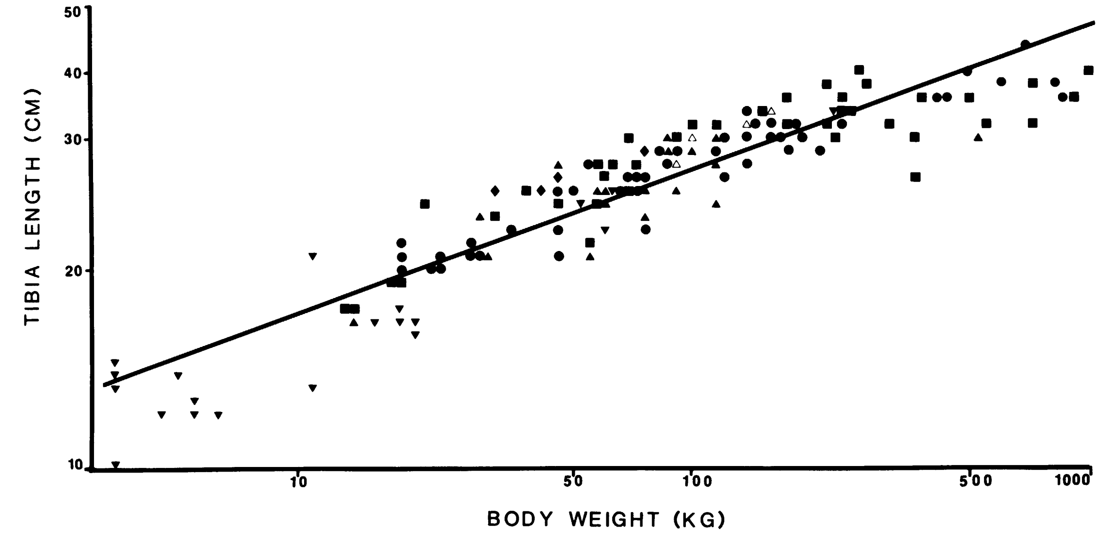

FIG. 5. Length of tibia plotted against body weight on logarithmic coordinates. Symbols as defined in figure 2.

Bovidae. The shape changes described above show conclusively that for these bones the maintenance of elastic similarity is not an important structural consideration. This does not necessarily mean that elastic resistance to bending is unimportant in these bones. In fact, bending in the transverse plane may be structurally critical. However, the evidence does show that the simple application of the elastic formula will not completely explain ungulate skeletal structure.

SCALING RELATIONSHIPS OF BONE LENGTHS AND BODY WEIGHT

Both forelimb and hindlimb total lengths scale with negative allometry and both are closer to elastic predictions than to geometric (table 3). Although total limb lengths can be fitted to a straight line both plots (fig. 7, forelimb, is typical) show that at high body weights total limb length increases slowly or not at all as body weight increases. Large bovids therefore have relatively shorter legs than small bovids, as has commonly been observed for the Bovini. However, the scaling relationships of total limb length cannot be entirely understood unless the scaling relationships of individual elements are also known. Although total limb lengths scale at exponents which do not differ significantly from elastic predictions, if limbs truly scale elastically the individual segments of the limbs should also scale elastically. If the segments do not scale elastically then limb lengths cannot be said to form an elastic series.

The plot of total hindlimb length gives a good fit to a straight line but above body weights of about 250 kg total limb length increases slowly or not at all. The three bones which comprise the hindlimb do not scale in similar ways; nor do all three bones follow the pattern for total hindlimb length. The femur scales most closely with body weight, and its exponent does not differ significantly from elastic predictions but does differ significantly from isometry. Of the long bones, the femur has the highest correlation coefficient with body weight and there is little scatter in the plot (fig. 4). There is no apparent correlation between habitat and femur length. There is a slight tendency for the curve to flatten at higher body weights, but it is not marked. Length of the femur seems to be almost entirely dictated by body weight, and at close to elastic predictions.

The tibia displays negative allometry as do the other limb elements but it increases more

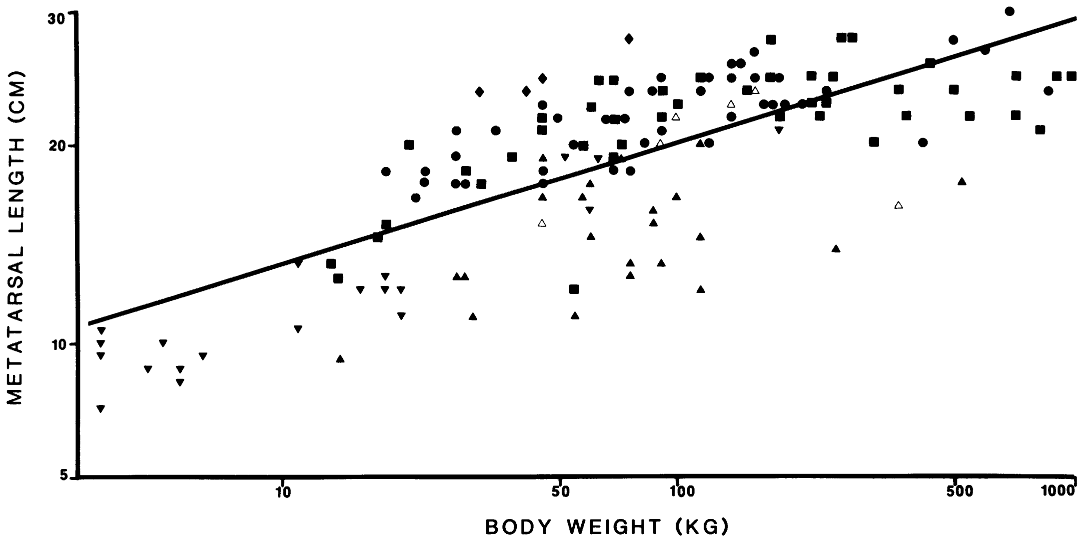

FIG. 6. Length of metatarsal plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

slowly with increasing size than do other elements, and the scaling relationship differs significantly from elastic predictions. Although the relationship of tibia length to body weight can be fitted to a straight line, figure 5 shows that the line is curved. The Bovini and large Tragelaphini (those species with body weights above 300 kg) form a flattened portion of the curve at the upper body sizes. A downward curve in smaller bovids results mainly from the shorter tibia in Cephalophini; I consider this to be a habitat-related difference (Scott, 1979). Although small and large bovids show deviations from the basic tibia length to weight relationship, the rest of the Bovidae scale predictably with body weight; for the most part habitat does not seem to affect tibia length. For all but the largest and smallest bovids tibia length increases regularly with body size, but at a rate less than that predicted by elastic scaling theory.

The shape changes, although not sufficient in magnitude to definitely exclude the tibia from consideration as an elastic series, differ from those in other limb elements. Size, more than habitat, seems to explain changes in shaft shape. The deviations of tibial length from a regular relationship with body weight are also related to size: larger bovids show greater deviations from the regular scaling relationships. Increased stresses generated in the tibia as size increases are probably neutralized by changes in shape rather than by maintaining elastic scaling relationships.

Metatarsal length does not scale closely with body weights, although lengths do generally increase with negative allometry as body weights increase (fig. 6); exponents differ significantly from elastic predictions. The deviations from a regular scaling relationship are instructive in structural terms: the scatter in these plots is predictable by habitat groups. Those species which live in open country (Group 1) have relatively long metapodials whereas those that live in mountainous habitat (Group 4) have relatively short metapodials. Species living in broken woodland (Group 2) or rolling hills (Group 5) are intermediate. Large species have relatively short metatarsals regardless of habitat. Body size seems to be a more important determinant of limb length in large species than is habitat. Although the longest limbed of the large species are the open habitat eland and giant eland, *Bison* and *Syncerus* have relatively short limbs, and some large forest-living species are also relatively long limbed. Differences in limb proportions in large bovids may be more independent of habitat since large species do not depend on either flight

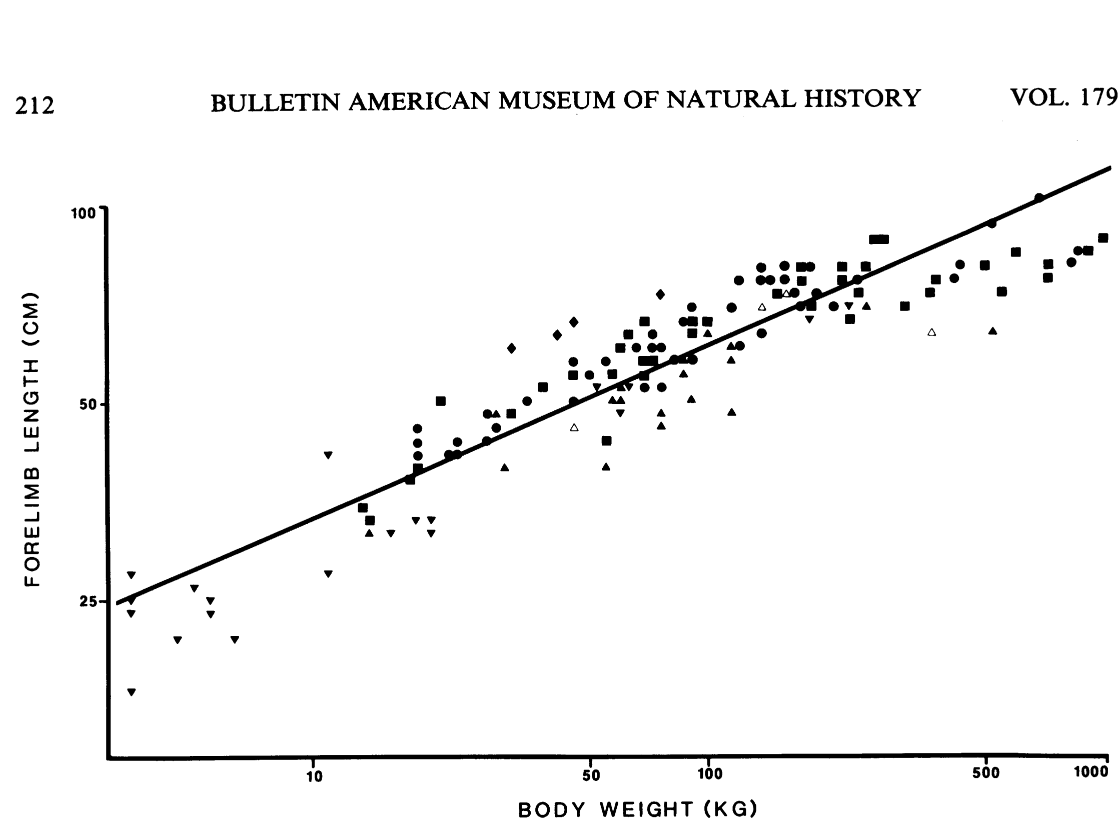

FIG. 7. Length of forelimb plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

or crypsis as a defense against predators. These species depend largely on size and group defense or mobbing by the entire herd.

The scaling relationships of forelimb were calculated in two ways: with and without scapular length. Both relationships display negative allometry and neither differs significantly from elastic predictions (table 3). Both relationships give a good fit to a line but are in fact curvilinear (see fig. 7). The graph for forelimb length versus body weight is especially interesting in that it is a much more convex curve than any of the other plots and levels off above body weights of about 175 kg, with a downward curve at lower body weights. The graph of forelimb length plus scapula also shows a pronounced flattening at the upper body weights, but beginning at higher body weights. Since scapula length increases more rapidly with body weight than other elements, adding it to forelimb length results in the slope of the middle part of the curve appearing steeper, with fewer species placed in the flattened part of the curve. Large species and many small ones still have relatively short legs when the scapula is included, indicating that these species do differ from the rest of the bovids. As for the hindlimb, the segments which comprise the forelimb do not scale in similar ways nor do they scale in the same way as total forelimb length.

Of the three limb bones proper the humerus scales most closely with body weight and has the highest correlation coefficient between length and body weight. The exponent differs significantly from both geometric and elastic predictions, although the elastic value lies just outside the 95 percent confidence interval. Interesting deviations from a regular scaling relationship are found (fig. 8). The upper end of the line tends to level off slightly, although probably not enough to warrant calling the graph curved. This indicates that a single scaling relationship may not apply over a large size range, even within a family. For bovids above 300 kg elastic criteria may not be the only ones which govern length to weight relationships. Problems may thus arise in extrapolating curves beyond a certain weight, or beyond the size range of species included. The only deviations from the length to weight allometric trends in proximal limb

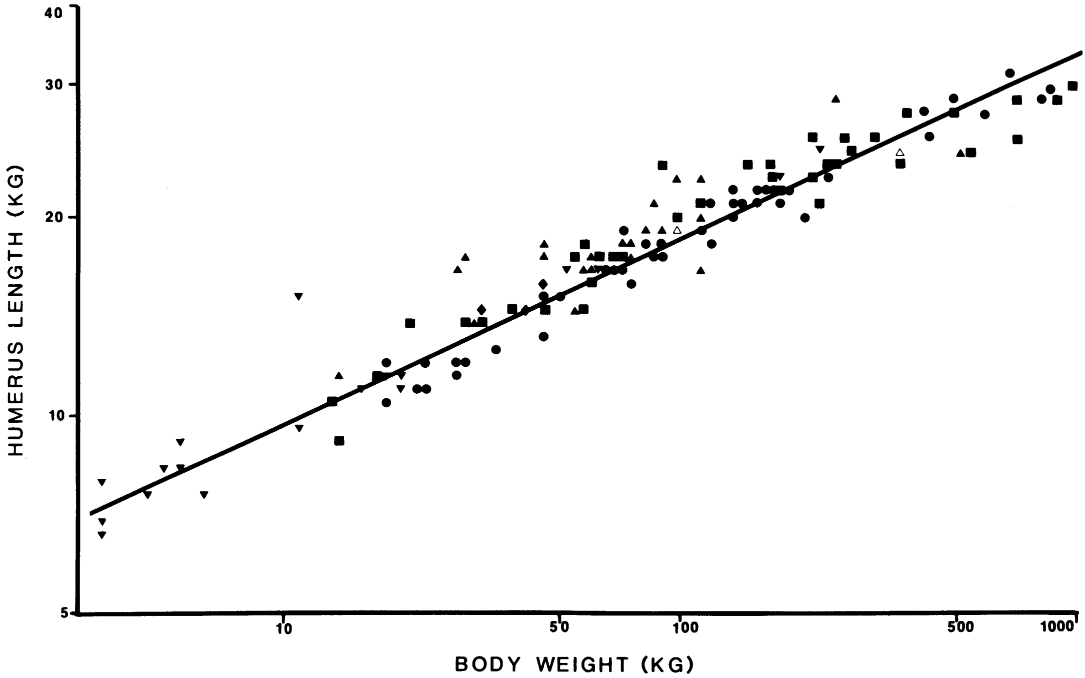

FIG. 8. Length of humerus plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

bones among smaller Bovidae are found in the Rupicaprini, Ovibovini, and some Tragelaphini which comprise most of Groups 2 and 4. These groups lie above the line of best fit in the humerus length–weight plot. Thus the species in these tribes seem to have a longer humerus than expected for a given body weight. The longer humerus is predictable on mechanical grounds for Rupicaprini and *Budorcas* (Scott, 1979) but why this should be true for Tragelaphini is not yet clear.

The allometric exponent obtained for the length of radius versus body weight plot is not significantly different from the elastic prediction of 0.25. Although regression of radius length to body weight gives a good fit to a straight line, visual examination of figure 9 shows clearly that the line is curved, and that the amount of scatter varies in different parts of the curve. The curve is distinctly flattened in its upper portion; this flattened portion includes not only the Bovini and the large Tragelaphini but also some of the larger Reduncini and Hippotragini. The lower end of the curve shows a large amount of scatter, with the part of the curve containing the Cephalophini and Neotragini placed in Group 3 showing a downward curvature. The middle portion of the curve, from species with body weights of about 20 kg to about 200 kg has a steep slope; that is, radius length increases rapidly with increasing body size. The lower section from 20–55 kg shows very little scatter; from 55–200 kg, there is a great deal of scatter, which occurs in a regular fashion depending on the habitat group to which species belong. The species which live in open country (Group 1) all lie along the uppermost part of the middle portion of the curve. Rupicaprini and Caprini which live in mountainous terrain (Group 4) all lie along the lowest part of the curve in their size range. For their weight these species have a radius shorter by as much as ten centimeters than that of an open-country species. These adaptational differences are discussed in Scott (1979) and will be described further elsewhere.

The scaling relationships of the metacarpal are very similar to those of the metatarsal except that metacarpal lengths appear to show

FIG. 9. Length of radius plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

slightly more scatter than do metatarsal lengths (see fig. 10). The patterns of variation related to habitat are identical with those of the metatarsal. The similarities of scaling relationships and habitat variation in the metapodials suggest that elastic factors may operate to determine dimensions within a habitat since shape is relatively constant within a habitat group. That is, bovids of the same adaptive type may scale elastically, but different adaptive types may have different constants. This seems not to be the case. The exponents obtained for length against body weight regressions for individual habitat groups vary widely and do not approach elastic predictions (table 4). Even within a group of morphologically similar species, maintenance of elastic similarity does not seem to be structurally important in distal elements. Thus, locomotor demands related to habitat are more important in determining metapodial length than any scaling factor. This does not mean that elastic resistance to bending forces is unimportant, but it does indicate that no single factor governs metapodial scaling.

The interpretation of the regressions of scapular length against body weight presents some problems. Scapula length increases more rapidly with increasing size than do other limb segments. The exponent does not differ significantly from isometry but differs significantly (0.05 level) from elastic predictions for length versus body weight. Several possible explanations have been offered for the difference between scaling relationships of the scapula and other limb elements. I believe that scapular length is determined complexly and that two relevant functions are the role of the scapula in increasing stride length of the forelimb and its role as the site of origin of many forelimb muscles. McMahon (personal commun.) has suggested that scapular length scales elastically as a diameter rather than a length.

In ungulates the scapula is free to move in the same plane as the rest of the forelimb and is functionally part of forelimb length. Scapular length would therefore be expected to scale at close to the same exponents as other limb segments. The more distal limb segments increase in length more slowly with body weight than proximal elements and show shape changes: those changes indicate increased stresses in distal limb elements. It may thus be more important mechanically to

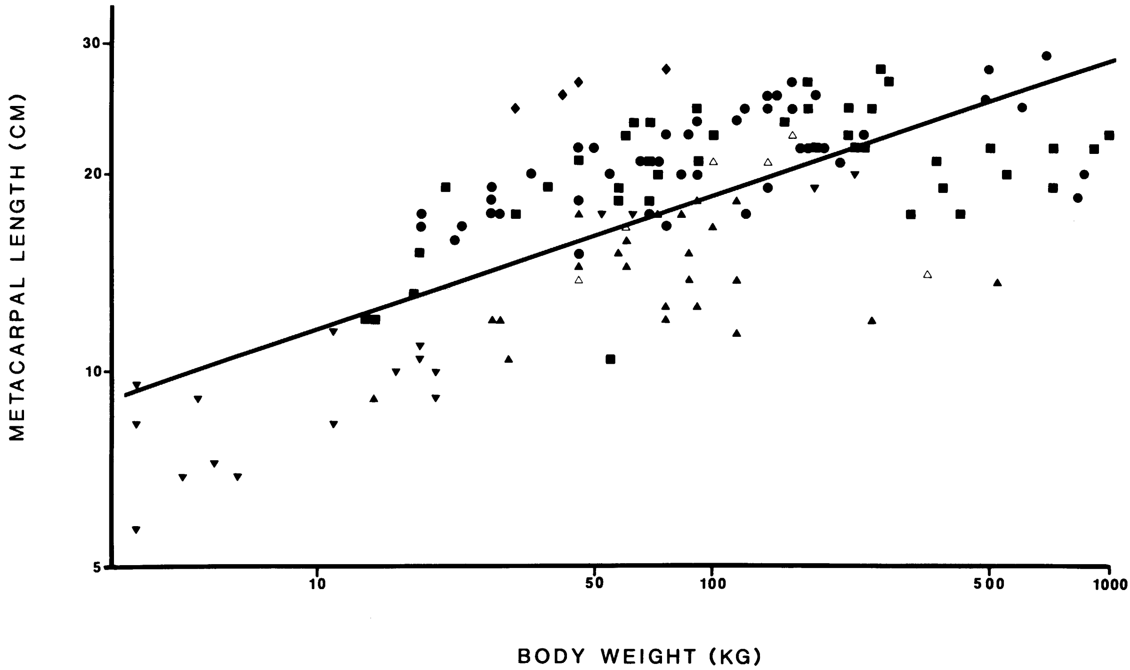

FIG. 10. Length of metacarpal plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

increase proximal limb segments so that they form a larger percentage of limb length as body weight increases. That is, it may be more advantageous to increase the part of the limb subjected to least bending stress. This is especially true in the forelimb because in large ungulates the forelimb is emphasized in locomotion, pushing off the single suspended phase of the gallop, which adds to the length of the stride.

Scapular dimensions must also be affected by the function of the scapula as the origin of many forelimb muscles, most of which have a fleshy origin. The critical dimension of this bone with respect to muscular origins would be area. If area of the scapula scaled as some function of body weight, its linear dimensions would then scale as one-half of that function. Alexander (1977) found that muscle area of the species he studied scaled as body weight to the 0.75; one-half of 0.75 is 0.375. The area of the scapula could thus be a primary factor determining its scaling relationships, resulting in the length dimensions found. The scapula almost certainly does not scale simply as a limb segment: both factors discussed must influence its dimensions. Scapular shape may not be constant in the Bovidae. I am currently studying scapular morphology to determine whether there are shape changes related to size or habitat, which may distort scaling relationships.

The exponent obtained for the scapular length to body weight relationship is significantly different from elastic predictions for length versus body weight scaling relationships, and is not close to that value. However, it is close to the exponent elastic criteria predict for diameter and circumference to body weight relationships (0.375), although it dif-

TABLE 4
Scaling Relationships Within Habitat Groups[a]

	Metacarpal	Metatarsal	Femur
Group 1	.1528	.1524	.2703
Group 2	.2006	.1898	.2757
Group 3	.1181	.1385	.2462

[a] Exponents were calculated as in table 2 for length of femur, metacarpal and metatarsal against body weight for groups 1, 2, and 4.

fers significantly from the elastic prediction at the 0.05 level. Because the scapula lies along the thorax, McMahon (personal commun.) suggested that scapular length would be defined by the size of the thorax. Two questions arise from this speculation: first, does body circumference scale elastically with weight, and second, can the scapula be viewed simply as a fraction of that circumference. To address the first question, thoracic circumference does scale against weight at close to elastic predictions (table 3), although the exponent is significantly different from elastic predictions for those bovids measured by Sachs (1967). The relationship of thoracic circumference to body weight thus conforms closely to elastic theory.

I find it overly simplistic to regard scapular length merely as an inert correlate of thoracic circumference, although McMahon's suggestion cannot be disproved on the basis of the scaling relationships of scapula and thorax circumference. The scapula lies obliquely along the lateral wall of the thorax but Sachs (1967) measured heart girth perpendicular to the long axis of the body, just posterior to the forelimbs, so they may not be entirely comparable. It is unreasonable to consider the scapula simply as part of the circumference of the thorax; however, length of scapula must be limited by the size of the thorax.

The limbs of Bovidae are therefore not isometric with body weight, nor do they truly scale elastically, even though total limb lengths do not differ significantly from elastic scaling. Individual limb bones do not scale at elastic exponents in all cases and some exhibit geometric changes which preclude application of elastic theory. In addition, changes in limb length relative to body size do occur according to the habitat in which the species are found. These adaptive changes produce deviations from regular scaling trends.

SCALING RELATIONSHIPS OF TRUNK DIMENSIONS

The scaling relationship of body length to body weight (data from Sachs, 1967) does not differ significantly from elastic predictions (table 3). As was discussed above, thoracic circumference scales at close to elastic predictions. Trunk dimensions generally seem to give good fit to elastic theory, as do the more proximal elements. The main body mass and related limb segments thus seem to be more closely controlled in their length dimensions than are distal elements. Most of the limb musculature in ungulates is proximal, with the mass of the locomotor musculature taking origin from the limb girdles, humerus, and femur. Alexander (1977) found that muscle mass and fiber area also give good fits to elastic predictions.

This intimate association of the main mass of skeletal musculature with the axial skeleton and proximal parts of the appendicular skeleton may necessitate that these locomotor parts scale in similar ways. If elastic factors are important determinants of proportions it is not surprising that these proportions of the locomotor apparatus scale at close to elastic predictions. The distal limb elements in ungulates are not associated with the bulk of the body mass, and thus need not be constrained by changes in other proportions. It seems to be more important to vary distal limb segment lengths adaptively according to the demands of habitat.

The constraints of association dictate a quite conservative trunk plan in the Bovidae, but the members of the tribe Bovini deviate somewhat from this plan and may lie at the upper size limit for its maintenance. Bovini seem to scale with other members of the Bovidae in trunk dimensions, deviate only slightly for humerus and femur, but differ considerably in other postcranial proportions (Scott, 1979). These deviations from the basic body plan probably allow Bovini to reach large size. During the Pleistocene Bovini much larger than modern species existed but this does not seem to be true of most other tribes of bovids. Bovini are probably near the upper size limit for maintaining the elastic similarity which seems to characterize the trunk structure of the Bovidae. This is not a habitat difference, since large bovids are found in a variety of habitats.

SCALING RELATIONSHIPS OF DIAMETERS, AREAS, AND BODY WEIGHT

The exponents for all diameters and midshaft areas of forelimb bones show positive allometry, whereas those of the hindlimb are

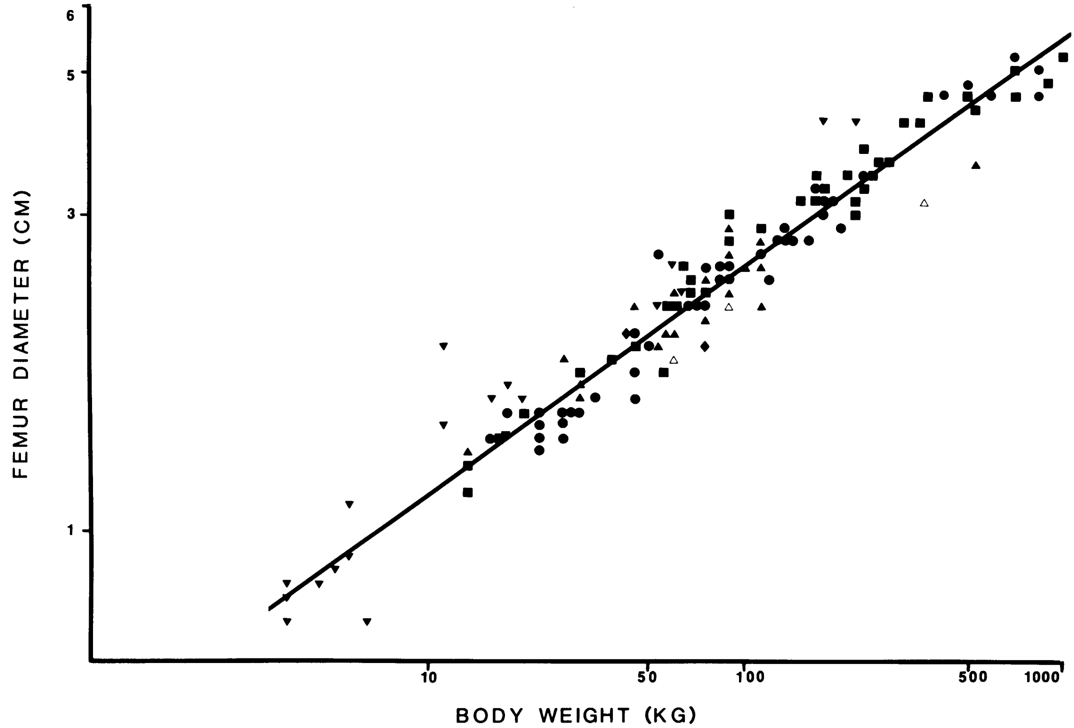

FIG. 11. Antero-posterior diameter of femur plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

either not significantly different from isometry or display negative allometry. Except for the metacarpal the forelimb exponents do not differ significantly from elastic predictions, but those of the hindlimb, excepting some femoral dimensions, do. The correlation coefficients and plots for these dimensions definitely show that they scale more closely with body weight than do lengths, even for distal bones (tables 5, 6, and 7). This is true for all long bones including those in which cross-sectional shape changes occur. Plots of area against body weight seem in general to show less scatter than do diameter against weight plots (compare figs. 11 to 12 and 13 to 14). These results strongly suggest that maintenance of a particular amount of bone relative to weight in a cross section is an important structural constraint.

Intuitively this might suggest that maintaining compressive strength (which relates to area) is the critical factor, as has been suggested in the past. However, if compressive strength were the structural requirement governing the scaling relationships of area and weight the expected exponents would be about 1.00 and none of the exponents are close to this. Increasing the amount of bone in a cross section also increases resistance to bending, and fractures are most commonly initiated by bending or shear (Wainwright et al., 1967). Together with the fact that half of the exponents do not differ from elastic predictions, this suggests that the area of a bone is structurally controlled at least in part by its elastic resistance to bending.

If this is so one of the more striking results of the area to weight relationships is very puzzling: all of the hindlimb bones, whether they change shape or not, are more slender than expected by elastic criteria. These results are similar to those obtained by Alexander (1977), who attributed differences from elastic predictions to changes in the angle between tibia and metatarsal during galloping in different species. This angle varies from 75 degrees in *Gazella thomsoni* to 60 degrees in *Syncerus caffer*. Alexander notes that the bending moment about a joint would vary with the angle of the joint. In order to equal-

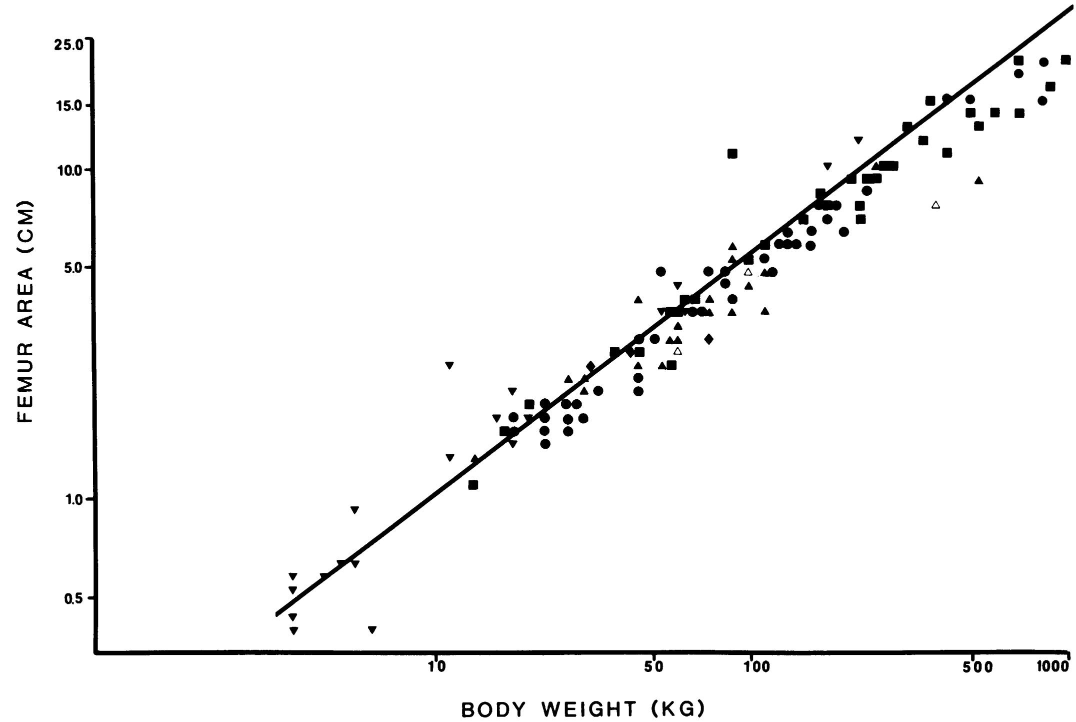

FIG. 12. Area of femur plotted against body weight on logarithmic coordinates. Symbols as defined in figure 2.

TABLE 5
Scaling Relationships of Diameters Versus Body Weight[a]
(As in table 3)

Bone	Exponent	Constant	Correlation Coefficient	Elastic?
	Anteroposterior Diameters at Midshaft			
Humerus	.3808 ± .0166	02.05	.845	yes
Radius	.3664 ± .0121	03.40	.867	yes
Metacarpal	.3347 ± .0126	02.81	.821	no
Femur	.3417 ± .0125	01.90	.872	no
Tibia	.3130 ± .0146	01.93	.847	no
Metatarsal	.3106 ± .0126	02.15	.832	no
	Anteroposterior Diameters at Proximal End			
Metacarpal	.3324 ± .1023	02.16	.842	no
Metatarsal	.3071 ± .0105	01.40	.845	no
	Anteroposterior Diameters at Distal End			
Metacarpal	.3448 ± .0144	02.57	.800	no
Tibia	.3184 ± .0107	01.50	.872	no
Metatarsal	.3104 ± .0125	02.17	.853	no

[a] Elastic prediction for exponent is 0.375. All correlation coefficients are significant at the .001 level.

TABLE 6
Scaling Relationships of Diameters Versus Body Weight[a]
(As in table 3)

Bone	Exponent	Constant	Correlation Coefficient	Elastic?
	Transverse Diameters at Midshaft			
Humerus	.3810 ± .0134	02.49	.890	yes
Radius	.3623 ± .0125	02.01	.866	yes
Metacarpal	.3663 ± .0219	02.59	.809	yes
Femur	.3204 ± .0125	01.80	.853	no
Tibia	.3319 ± .0120	01.81	.894	no
Metatarsal	.3237 ± .0163	02.35	.858	no
	Transverse Diameters at Proximal End			
Metacarpal	.3596 ± .0117	01.56	.876	no, barely
Metatarsal	.3220 ± .0114	01.49	.845	no
	Transverse Diameters at Distal End			
Metacarpal	.3872 ± .0180	01.78	.829	yes
Tibia	.3306 ± .0114	01.21	.874	no
Metatarsal	.3434 ± .0122	01.46	.854	no

[a] Elastic prediction for exponent is 0.375. All correlation coefficients are significant at the .001 level.

ize stress in limbs with the different bending moments he observed, he calculates that an exponent of 0.362 for the diameter to weight relationship is necessary, rather than the exponential value predicted by elastic criteria (0.375). Although 0.362 is closer to the values he obtained, both this value and that predicted by elastic criteria lie within the 95 percent confidence intervals of the hindlimb exponents. Since neither theoretical value differs from his observed values, a clear choice cannot be made between the two.

Although Alexander's explanation for the deviation of the hindlimb from elastic predictions may be correct, he assumes that all limb segments scale elastically and this is not true. Moreover, relative lengths of segments vary between species and he does not consider this. Another factor may be important: large bovids appear to be more massive in the forequarters than in the hind. Smith and Ledger (1965) give data on forelimb and hindlimb weights as a percentage of total body weight which show that both limbs are a declining percentage of weight as size increases; but the hindlimb seems to decline more rap-

TABLE 7
Scaling Relationships of Area at Midshaft Versus Body Weight[a]
(As in table 3)

Bone	Exponent	Constant	Correlation Coefficient	Elastic?
Humerus	.7629 ± .0281	06.51	.934	yes
Radius	.7309 ± .0226	08.74	.925	yes
Metacarpal	.7054 ± .0328	09.38	.806	no
Femur	.6629 ± .0229	04.36	.927	no
Tibia	.6461 ± .0250	04.47	.927	no
Metatarsal	.6354 ± .0235	06.44	.918	no

[a] Elastic prediction for this relationship is 0.75. All correlation coefficients are significant at the .001 level.

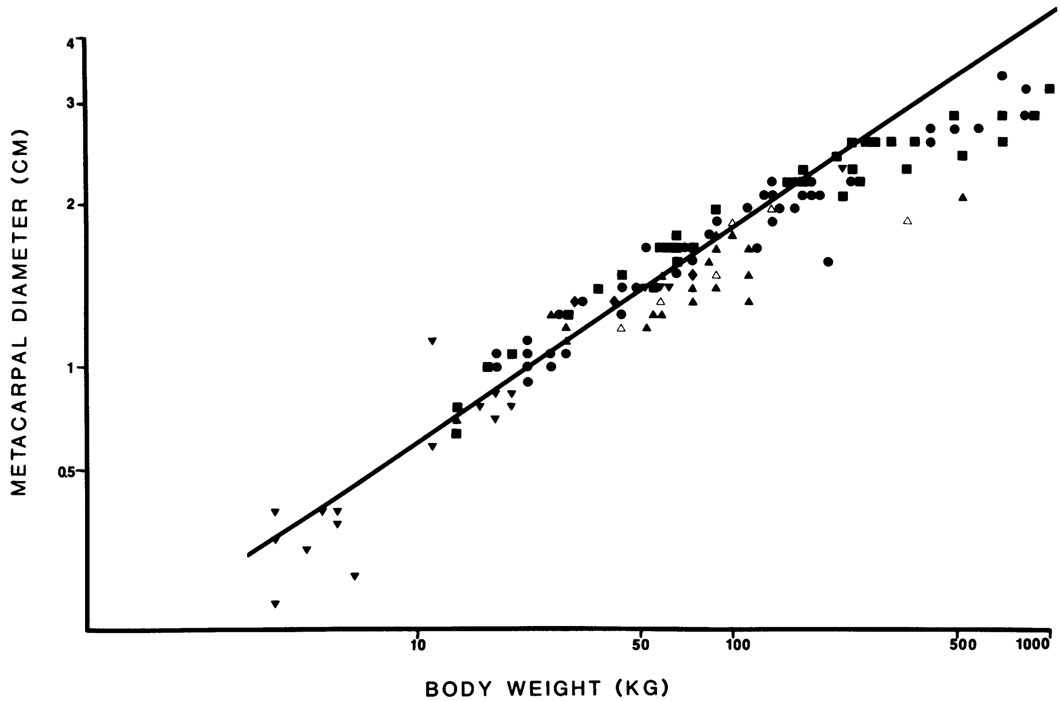

FIG. 13. Antero-posterior diameter of metacarpal plotted against body weight on logarithmic coordinates. Symbols as defined in figure 2.

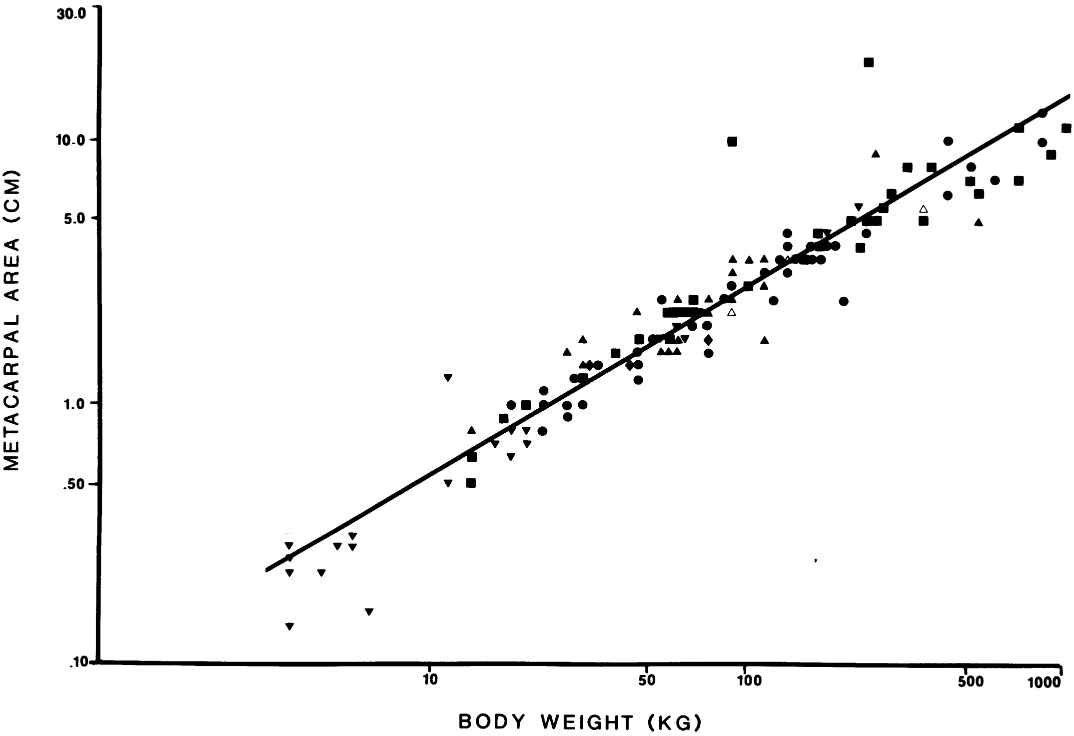

FIG. 14. Area of metacarpal shaft plotted against body weight on logarithmic coordinates. Symbols as in figure 2.

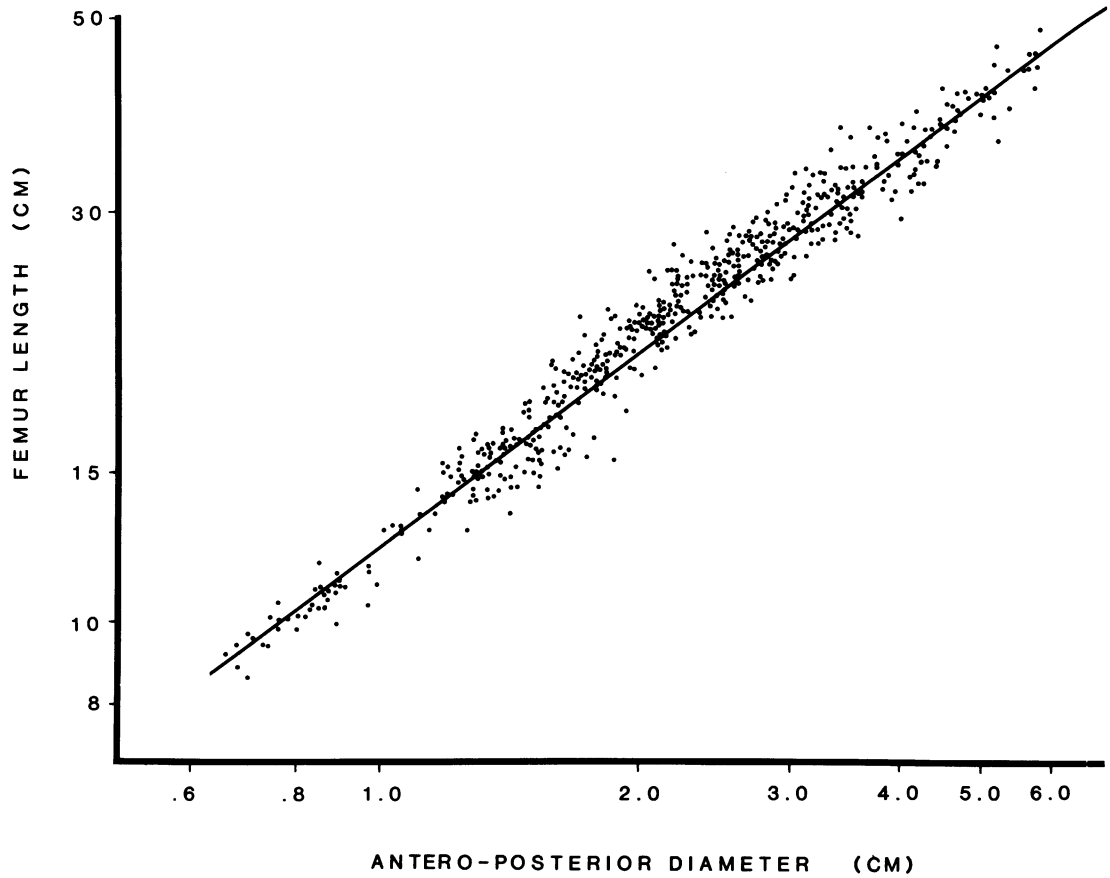

FIG. 15. Femur length plotted against antero-posterior diameter on logarithmic coordinates. Habitat groups are not indicated.

idly than does the forelimb. As the center of mass shifts forward in larger bovids the area of the hindlimb becomes slightly more slender than expected, but the forelimb remains close to elastic predictions.

Several mechanical considerations therefore seem to govern the relationships of diameter and area to weight. Resistance to bending is probably one such structural consideration. These scaling relationships are modified by an anterior shift in the distribution of body weights as bovids become larger. Whereas the area maintains a fairly constant relationship to weight, the cross-sectional shape of the area may not remain constant in all bones. As discussed above, in distal bones transverse dimensions may increase more rapidly with size than predicted by elastic theory, or may increase because of the demands of locomotion in certain habitats. These deviations in scaling relationships of diameters result in different cross-sectional shapes.

RELATIONSHIPS OF LENGTH TO DIAMETER

The relationships of length to diameter formed the basis for the elastic theory and the results of scaling length against diameter for the Bovidae provide an important test for that theory. Although the exponents I found for length to diameter relationships (table 8) are close to those McMahon (1975a) reported for bovids, only the exponents for tibia and metatarsal do not differ significantly from elastic predictions at the 0.05 level. All the values for the three bones that do not change shape (humerus, femur, and radius) differ significantly from elastic predictions, and all dif-

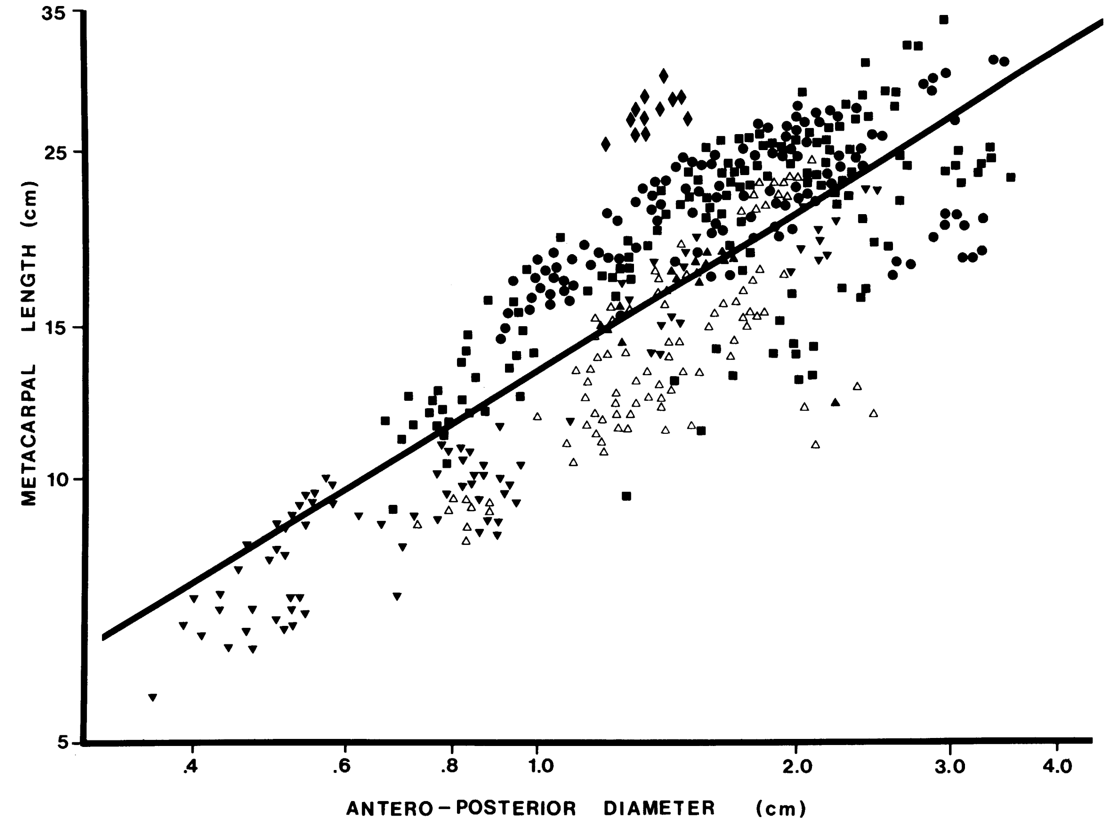

FIG. 16. Metacarpal length plotted against antero-posterior diameter on logarithmic coordinates. Symbols as in figure 2.

fer in the same direction. They are slightly longer than expected for a given diameter, or conversely, slightly more slender than expected for a given length. Metapodials tend to be shorter than expected for a given diameter or thicker than expected for a given length. The length to diameter relationships for humerus and femur are tightly correlated, with little scatter (fig. 15); tibia shows a moderate amount of scatter and radius, metatarsal, and metacarpal (fig. 16) the greatest scatter.

As is to be expected all the bones which show marked variation related to habitat in the length to body weight plots also show marked variation in the length to diameter plots. It is clear that diameters are largely determined by body weight, whereas lengths are free to vary with habitat. It might then be asked, are there any limits to the amount of variation which occurs at a particular diameter? For the metapodials the answer definitely appears to be yes. These two bones scale at exponents less than elastic predictions: although they do not scale elastically neither do they violate elastic relationships of length to diameter. Distal long bones are in general more conservative with respect to maintaining resistance to bending than McMahon has suggested.

The apparent exceptions to this are three species: the gerenuk (*Litocranius walleri*), the dibatag (*Ammodorcas clarkei*), and the dama gazelle (*Gazella dama*). These species have exceptionally long metapodials relative to both body weight and diameter (fig. 16). The long limbs of these animals are an adaptation to feeding on the high level browse on which these species specialize. Locomotor stresses in these long limbs appear to be neutralized behaviorally. These species are found in areas with brushy cover, and the primary defense

TABLE 8
Scaling Relationships of Length to Diameter for All Long Bones

Bone	Exponent	Constant	Correlation Coefficient	Elastic?
Humerus	.7012 ± .013	09.1	.960	no
Radius	.7234 ± .022	15.6	.882	no
Metacarpal	.6102 ± .038	13.6	.675	no
Femur	.7565 ± .010	12.5	.904	no
Tibia	.6862 ± .017	16.5	.904	yes
Metatarsal	.6500 ± .025	12.9	.777	yes

[a] Elastic prediction for this relationship is 0.67. All correlation coefficients are significant at the .001 level.

against predators is by crypsis. The gerenuk is reported to move in a crouching trot preferentially to a gallop (Best, Edmund-Blanc, and Witting, 1962). This gait would place less stress on the elongate limbs.

The femur, humerus, tibia, and radius tend to be longer than expected for a given diameter, although not greatly so. The lengths and diameters of the femur, humerus, and tibia are closely correlated regardless of habitat. I believe that in part it is maintenance of resistance to bending which maintains these close relationships, even though the bones are more slender than would be expected by elastic scaling. The bending moments which act on any bone are in part offset by pull of the musculature which takes origin and inserts on these bones, although this does not altogether eliminate bending moments (Lanyon, 1980). In ungulates the musculature is concentrated proximally and metapodials are surrounded by very little musculature. Bending moments in proximal bones may thus be partially offset by effects of the musculature. The proximal bones must also be constrained by the musculature which takes origin and inserts on them, since this musculature requires larger areas for insertion as size increases. These bones would therefore be limited in possible directions for adaptive changes. The radius appears to be intermediate in degree of variation as might be expected by the intermediate amount of musculature which inserts and takes origin there. Proximal bones are therefore subject to the same constraints as the trunk.

SUMMARY AND CONCLUSIONS

Like most groups of mammals the Bovidae show regular interspecific allometry in their skeletal dimensions. These allometric relationships provide insight into the functional changes required by increasing size. As Gould (1975) has pointed out, geometric similarity is rare in interspecific scaling because as size increases, shape must change to maintain functional equivalence. The nature of the shape changes can be used to identify the physical or structural constraints which define functional equivalence. The scaling relationships of Bovidae present a complex picture: all dimensions do not show similar relationships to body weight. Scaled against body weight limb lengths increase with definite negative allometry, whereas diameters and areas vary from slightly positive in proximal bones to slightly negative in more distal bones, and slightly higher exponents are found for forelimb relationships. Although relationships of area and diameters hover around isometry, bovids are not geometrically similar since limb bone lengths display marked negative allometry. As bovid species increase in size their limbs become shorter and thicker relative to body weight, but each bone also becomes much thicker relative to its length. This strongly suggests that resistance to bending is an important factor in the design of the bovid skeleton.

It has been widely recognized by researchers in properties and design of bone that resistance to bending must be an important structural consideration since most fractures are initiated by the tensile forces created by bending moments. However, McMahon's suggestion that animals in general and ungulates in particular scale in such a way as to maintain elastically similar resistance to bending, and that this structural limitation is the major factor in determining skeletal dimensions, is incorrect. Many of the dimensions differ significantly from elastic predictions and, in addition, changes in the geometry of long bones violate elastic assumptions. Although bovids do not maintain elastic similarity in total body form, the length, diameter, and area relationships suggest that maintaining resistance to bending in individual bones as size increases is an important structural consideration.

Several other factors affect skeletal dimensions as size increases. Angulation of bones in large ungulates is less than in small ones, decreasing the bending moments applied to the bones. Larger ungulates also place smaller multiples of body weight on their limbs while they run (Alexander et al., 1977). Both of these factors help to explain why diameters and areas of some long bones do not increase as rapidly with body size as might be expected. In addition, the center of mass in large bovids shifts forward, resulting in negative allometric relationships for hindlimb elements.

Adaptations to the locomotor demands of particular habitats act independent of size, and these distort the scaling relationships dictated by size related mechanical constraints. Distal long bone lengths vary relative to habitat within certain limits. Species living in open country and specialized for speed have longer distal elements, those living in mountainous country and specialized for climbing have shorter metapodials, whereas those living in partly open woodland or hilly country tend to have bones of intermediate lengths. In addition species living in mountainous areas or of very large body size show adaptations in the shape of metacarpals and metatarsals to minimize lateral bending.

The results of this study also point out some factors which should be considered in scaling studies on other groups. The skeletal dimensions of the family Bovidae are complexly determined by a number of factors related both to size and habitat. No single physical or mechanical principle can explain all dimensional changes, although minimizing bending forces appears to be an important factor. Thus, no single scaling theory, elastic or otherwise, should be expected to determine dimensions in any group, especially a taxonomically mixed group. In a series of unrelated species differences in basic geometry of bones and adaptive changes related to habitat will distort many scaling relationships. Alexander et al. (1979) have found that a "shrew to elephant" curve does in fact give poor fit to elastic theory, and that different taxonomic groups scale differently. The deviations from regular scaling trends seen in large Bovidae also point out difficulties in extrapolating allometric relationships: above certain body sizes changes in basic morphology may become important.

APPENDIX 1: SPECIMENS USED IN THIS STUDY

(Museum number, sex, and locality are given for each individual. Habitat group is given in parentheses after each species name.)

Tragelaphus angasi (Group 2)

BMNH 1936.3.30.1	M	Zululand
BMNH 1936.3.30.2	F	Zululand
FMNH 51777	M	East Africa; Chicago Zoological Society
AMNH 54389	M	Zululand

Tragelaphus buxtoni (Group 2)

AMNH 81019A	M	Abyssinia: Arusi Kaba Mt.
AMNH 81019B	M	Abyssinia: Arusi Kaba Mt.
AMNH 81020	F	Abyssinia: Arusi Kaba Mt.
AMNH 81003	F	Abyssinia: Arusi Kaba Mt.
AMNH 81016	F	Abyssinia: Arusi Kaba Mt.
AMNH 81015	F	Abyssinia: Arusi Kaba Mt.

Tragelaphus spekei (Group 2)

BMNH 1967.8.18.1	?	Northern Rhodesia
BMNH 1882.7.24.11	?	Gabun
BMNH a1901.8.9.82	M	Lake Mitiana
USNM 164558	M	Uganda: Kampala
AMNH 113815	M	Africa: Fan Awing
AMNH 113818	M	Africa
AMNH 53209	M	Niapu
AMNH 53212	M	Niapu
AMNH 53216	F	Niapu
AMNH 53221	F	Niapu

Tragelaphus scriptus (Group 3)

USNM 164560	F	Uganda: Kabula Mliro
AMNH 36402	M	Umbagasi
AMNH 53244	M	Faradje
AMNH 53245	F	Faradje
AMNH 53246	M	Faradje
AMNH 34751	M	British East Africa: Charanganyi Hills
AMNH 54753	F	British East Africa: Charanganyi Hills
YPM 03980	M	Africa: Amoro River

Tragelaphus imberbis (Group 2)

MCZ 8005	F	No data
FMNH 57824	M	Africa, captive; Chicago Zoological Park
FMNH 43906	F	As above
FMNH 54261	M	As above
AMNH 82019	M	Tanganyika Territory: Gulwe
AMNH 82023	F	Tanganyika Territory: Gulwe

Tragelaphus strepsiceros (Group 2)

MCZ 15323	M	Sudan, Blue Nile
BMNH 1935.7.24.5	F	Darino, British Somaliland
BMNH 1935.12.12.4	M	Eirerib, Sudan
USNM 163320	M	British East Africa: Laikipia
USNM 163247	F	Lake Baringo

APPENDIX 1—(*Continued*)

AMNH 82018	F	Tanganyika Territory: Gulwe
AMNH 82015	M	Tanganyika Territory: Gulwe
AMNH 82014	M	Tanganyika Territory: Kilosa
AMNH 82013	M	Tanganyika Territory: Gulwe
Taurotragus oryx (Group 1/2)		
MCZ 1702	?	South Africa
BMNH 1960.11.10.3	M	Basso-Narok, Uganda
USNM 162985	M	British East Africa: N Guaso Nyiro, Latik
AMNH 34722	F	British East Africa: Uasio Gishu 7000′
AMNH 34724	M	British East Africa: Uasio Gishu 7000′
AMNH 82012	M	Tanganyika Territory: Kilosa
Taurotragus derbianus (Group 1/2)		
FMNH 54640	F	West Africa, captive; Chicago Zöological Park
FMNH 53866	M	As above
AMNH 81252	F	Sudan: Amardi
AMNH 53528	F	Garamba
AMNH 53530	M	Garamba
AMNH 53519	M	Garamba
AMNH 53521	F	Garamba
AMNH 53522	F	Garamba
AMNH 53534	F	Garamba
AMNH 53542	F	Garamba
Taurotragus euryceros (Group 3)		
BMNH 1934.11.9.1	F	Cameroons
BMNH 11959.1.2.2	F	Sierra Leone
MCZ 38013	M	Belgian Congo: Kisiki, 36 km N of Benikiwu, Parc National Albert
AMNH 88413	M	British East Africa
AMNH 88414	F	British East Africa
AMNH 90010	?	Kenya Colony: Aberdares
AMNH 53281	M	Bakufa
AMNH 53286	M	Poko
AMNH 81654	M	Nola: French Congo
AMNH 53266	F	Akenge
AMNH 53269	F	Bakufa
AMNH 53271	F	Bakufa
Boselaphus tragocamelus (Group 2)		
MCZ 1936	?	India
BMNH 1974.411	M	No data
BMNH 1949.1.30.1	M	No data
BMNH 1937.5.1.1	F	East Khandesh, Bombay, India
BMNH 1850.11.22.68	F	Purchased from Zoological Society ( )
USNM 269127	?	No history
Tetracerus quadricornis (Group 2)		
AMNH 54981	F	India: Attihan, Mysore
AMNH 54980	M	India: Attihan, Mysore
Bubalis bubalis (Group 2/3)		
MCZ 5002	F	India

APPENDIX 1—(*Continued*)

USNM 152159	M	National Zoological Park
AMNH 54765	M	Manas River, Assam
AMNH 54766	F	Manas River, Assam

Anoa depressicornis (Group 3)

MCZ 27999	F	Celebes (Western) Madjene
FMNH 98791	F	Locality unknown; Lincoln Park Zoo
AMNH 35380	M	N.Y. Zoological Society
AMNH 150050	M	Celebes; New York Zoological Society
AMNH 61145	?	Celebes
AMNH 61146	?	Celebes

Anoa mindorensis (Group 3)

USNM 219049	?	Philippine Islands: Mindoro
AMNH 31660	M	Philippine Islands: Mindoro

Bos gaurus (Group 2/3)

MCZ 36670	M	No data
BMNH 1847.12.15.2	F	Nepal
BMNH 1896.6.20.1	?	India
FMNH 31704	M	Cochin, China, 2 mi from Annam Border, Flat Rock River
AMNH 54469	M	India: Mysore
AMNH 54470	M	India: Mysore
AMNH 112979	?	S India: near Honametti Estate
AMNH 113746	M	India, Block 4, Billigirrigungans Hills
AMNH 113747	?	India: Madros, slope of Kullianay Betta

Bos frontalis (Group 2/3)

MCZ 6183	?	India

Bos banteng (Group 2)

USNM 154385	F	East Borneo: Pamukang Bay
USNM 198317	M	Borneo: Sungai, Pelawan
AMNH 54551	M	Zelon, Burma

Bos indicis (Group 2/3)

MCZ 51755	?	Florida: Fort Meade

Bos sauveli (Group 2/3)

MCZ 46589	M	Cambodia, Siem Reak Province
MCZ 38108	?	French Indochina, Provence de Kratie, near Samerong
USNM 361392	F	50 mi N of Chkep, Kampong, Thomson Province
USNM kouprey no. 2	?	As above

Bos grunniens (Group 4/5)

BMNH 1867.2.24.6	?	Ladak?
AMNH 22909	F	Central Park Zoo
AMNH 90186	M	Central Park Zoo
AMNH 90188	?	Central Park Zoo

APPENDIX 1—(*Continued*)

Syncerus caffer (Group 1)

BMNH 1874.11.2.4	F	Setit Valley, Ethiopia
AMNH 53566	F	Belgian Congo: Faradje
AMNH 53515	M	Belgian Congo: Garamba
AMNH 53576	M	Belgian Congo: Medje
AMNH 53587	M	Belgian Congo: Niapu
AMNH 53579	F	Belgian Congo: Medje
AMNH 5042	?	Central Park Zoo
AMNH 82004	M	British East Africa
AMNH 82006	M	British East Africa
AMNH 82005	M	British East Africa
AMNH 82007	F	British East Africa

Bison bison (Group 1)

MCZ 1770	M	Fort Hayes, Kansas
MCZ 11	M	Fort Hayes, Kansas
MCZ 1771	?	Fort Hayes, Kansas
MCZ 10	M	Fort Hayes, Kansas
FMNH 18850	?	Central Park Menagerie
FMNH 44708	M	No data

Bison bonasus (Group 2)

BMNH 1949.6.29.1	?	Woburn Abbey Park
AMNH 17355	M	Purchased, Sherer Co.

Cephalophus callipygus (Group 3)

MCZ 43044	M	Cameroons: Batouri District
MCZ 43045	F	Cameroons: Batouri District

Cephalophus dorsalis (Group 3)

MCZ 43048	F	Kanyol Village (4°N lat., 14°E long.), Batouri District, Cameroons
BMNH 1936.10.28.34	M	Batouri District, Cameroons
BMNH 1936.10.28.35	M	Batouri District, Cameroons
BMNH 1863.12.29.1	?	Purchased from Zoological Society
AMNH 52888	F	Akenge, Congo
AMNH 52887	F	Akenge, Congo
AMNH 52884	M	Akenge, Congo
AMNH 52928	F	Rungu, Congo
AMNH 52925	M	Poko, Congo
AMNH 52924	M	Poko, Congo
AMNH 52898	M	Akenge, Congo

Cephalophus leucogaster (Group 3)

BMNH 1950.9.23.1	M	Obala, Batouri District, Cameroons
AMNH 52824	F	Medje, Congo
AMNH 52788	M	Akenge, Congo
AMNH 52775	F	Akenge, Congo
AMNH 52778	M	Akenge, Congo
AMNH 52836	F	Niapu, Congo
AMNH 52861	F	Poko, Congo

APPENDIX 1—(*Continued*)

Cephalophus natalensis (Group 3)

AMNH 52992	M	Akenge, Congo
AMNH 52999	M	Akenge, Congo
AMNH 53009	M	Akenge, Belgian Congo
BMNH 1948.7.19.10	M	Heart of Mau Forest
AMNH 83387	?	East Africa
AMNH 52995	F	Akenge, Belgian Congo

Cephalophus niger (Group 3)

MCZ 39758	?	Cameroons

Cephalophus nigrifrons (Group 3)

YPM 0748	M	Central Belgian Congo
BMNH 1936.10.28.32	M	Obala, Batouri District, Cameroons
BMNH 1936.10.28.33	M	Obala, Batouri District, Cameroons
AMNH 52940	F	Akenge, Belgian Congo
AMNH 52943	M	Akenge, Belgian Congo
AMNH 52930	F	Akenge, Belgian Congo
AMNH 52931	F	Akenge, Belgian Congo

Cephalophus silvicultor (Group 3)

BMNH 1961.8.9.80	M	N Kabompo District, N Rhodesia
AMNH 53129	F	Akenge, Belgian Congo
AMNH 53138	M	Faradje, Belgian Congo
AMNH 53144	F	Niangara, Belgian Congo
AMNH 53153	M	Niapu, Belgian Congo

Cephalophus zebra (Group 3)

BMNH 1887.9.15.2	M	Duqueah River, Liberia

Cephalophus monticola (Group 3)

BMNH 1936.10.28.28	M	Kanyol Village, Batouri District, Cameroons
BMNH 1936.10.28.29	M	Kanyol Village, Batouri District, Cameroons
BMNH 1936.10.28.30	F	Obala, Batouri District, Cameroons
BMNH 1936.10.28.31	F	Obala, Batouri District, Cameroons
BMNH 1948.1311	M	Mambe, British Cameroons
AMNH 34736	M	British East Africa: Elgeyo Forest
AMNH 52758	F	Belgian Congo: Ngayu
AMNH 52755	M	Belgian Congo: Medje
AMNH 36375	F	British East Africa: Elgeyo Forest
AMNH 52726	?	Belgian Congo: Akenge
AMNH 52725	M	Belgian Congo: Akenge

Cephalophus maxwelli (Group 3)

YPM 1480	M	Africa

Sylvicapra grimmea (Group 2)

USNM 367434	F	Mozambique: Tete District
USNM 367409	F	Mozambique: Tete District
USNM 367424	M	Mozambique: Tete District
YPM 9433	M	Mozambique: Tete District

APPENDIX 1—(*Continued*)

YPM 5936	F	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
YPM 5832	F	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
YPM 9432	M	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
YPM 9494	M	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
YPM 9435	M	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
MCZ 14220	M	British East Africa: Kapiti Plains
MCZ 33887	M	Transvaal, Pretoria District
MCZ 15700	F	Sudan: Blue Nile, Magangani
MCZ 15699	F	Sudan: Blue Nile, Fazogh
MCZ 5012	M	South Africa
Kobus ellipsiprymnus (Group 2)		
BMNH 1940.104	M	No data
BMNH 1934.5.1.17	M	Gemesa, Sudan
USNM 252689	M	Sudan, Umbarbit
Kobus defassa (Group 2)		
MCZ 14219	F	British East Africa
MCZ 5019	?	Abyssinia
FMNH 54200	F	Africa, captive; Chicago Zoological Society
AMNH 82126	M	Sudan: Bahr-Al-Ghazal
Kobus kob (Group 1/2)		
BMNH 1934.5.1.12	M	Fan Ashir, Sudan
BMNH 1928.8.2.6	M	Lokila Mongalla
BMNH 1889.6.23.4	M	Kafau, NW Freetown, Sierra Leone
FMNH 51368	F	Africa, captive; Chicago Zoological Society
AMNH 53347	M	Faradje, Belgian Congo
AMNH 53398	F	Faradje, Belgian Congo
AMNH 82129	M	Sudan: Bahr-Al-Ghazal
AMNH 36397	M	British East Africa
AMNH 36396	M	British East Africa
AMNH 82130	M	Sudan: Bahr-Al-Ghazal
Kobus vardoni (Group 2)		
BMNH 1962.803	M	Near Lunga, Kabompo District, N Rhodesia (Zambia)
FMNH 34465	M	OFS, Legge's Island, Chobe River, Kasane
Kobus leche (Group 2)		
BMNH 1970.1030	?	Northern Rhodesia
BMNH 1969.1147	M	Northern Rhodesia
Kobus megaceros (Group 2)		
BMNH 1934.5.1.9	M	Pomamwer, Sudan
AMNH 82137	F	Sudan, Tonga Island
AMNH 113784	F	Sudan: Equatorial Province, 5 mi W of Gorgial
AMNH 113783	F	Sudan: Equatorial Province, 20 mi NE of Gorgial
AMNH 113782	M	Bahr-Al-Ghazal, Sudan
Redunca fulvorufula (Group 2)		
BMNH 1936.3.30.9	M	Zululand
YPM 5114	M	Kenya, NFD, 10 mi SW Isiolo

APPENDIX 1—(*Continued*)

AMNH 82064	F	British East Africa, Rift Valley
AMNH 82067	F	British East Africa, Rift Valley
AMNH 82063	M	British East Africa, Rift Valley
AMNH 82066	F	British East Africa, Rift Valley
YPM 5938	F	Kenya, NFD, 10 mi SW Isiolo
Redunca redunca (Group 2)		
MCZ 38014	M	Sudan, Blue Nile, El Mishvat
MCZ 14917	F	Sudan, Blue Nile, El Mishvat
AMNH 34757	F	British East Africa, Charugangi Hill
AMNH 34756	M	British East Africa, Charugangi Hill
AMNH 53294	M	Faradje, Belgian Congo
YPM 3995	M	Africa: Marijo Swamp, S Masai Reserve
YPM 3676	F	Africa: Amorro River
MCZ 15321	F	Sudan: Dinder River, El Kuka
Redunca arundinum (Group 2)		
USNM 469909	F	10 mi SW Rustenburg, Transvaal, South Africa
AMNH 80506	F	Chisongue Camp, Angola
AMNH 80508	M	Chitou, Angola
AMNH 80505	M	Chitou, Angola
AMNH 80507	M	Chitou, Angola
Pelea capreolus (Group 1/2)		
BMNH 1860.7.22.18	F	Zoological Society, captive
Hippotragus equinus (Group 2)		
BMNH 1928.8.2.8	?	Lokila
USNM 22440	?	No locality
MCZ 15315	M	Sudan, Blue Nile, Bados
FMNH 53697	M	Africa, captive; Chicago Zoological Park
Hippotragus niger (Group 2)		
BMNH 1964.7.8.1	F	Chipangali
BMNH 1935.5.8.1	?	No locality
BMNH 1936.3.11.1	?	No locality
USNM 218780	M	National Park Zoo
USNM 252518	M	National Park Zoo
USNM 396597	F	National Park Zoo
FMNH 34667	M	Angola, Quanza Luce River
FMNH 53870	M	S Africa, captive; Chicago Zoological Society
AMNH 87217	F	No data
AMNH 80461	M	Chitau, Angola
AMNH 80460	M	Chitau, Angola
AMNH 83476	F	Bechuanaland Protectorate, Tsotsorga Pan
AMNH 180359	M	Africa
Oryx gazella (includes *O. beisa*) (Group 1)		
YPM 6373	M	Africa: Kenya, Isiolo
MCZ 13206	M	British East Africa
MCZ 13241	F	British East Africa, Guaso Nyiro
BMNH 1936.3.28.2	M	Jubaland

APPENDIX 1—(*Continued*)

BMNH 1963.10.21.1	M	E Africa
USNM 26705	M	No history: National Zoological Park
FMNH 34436	M	Bechuanaland: N'Kate
AMNH 83495	F	Bechuanaland
AMNH 82042	M	North Guaso Nyiro, Kenya Colony
AMNH 82711	M	No data
AMNH 87213	F	No data
AMNH 87210	M	No data
AMNH 83486	F	Mababe Flats, Bechuanaland Protectorate
AMNH 82043	F	North Guaso Nyiro, Kenya Colony
AMNH 27808	M	Guasinaroch, British East Africa
Oryx leucoryx (Group 1)		
YPM 1508	F	Africa
USNM 282796	M	Arabia, National Zoological Park
Oryx tao (Group 1)		
AMNH 113804	?	Africa
AMNH 113805	?	Africa
Addax nasomasculatus (Group 1)		
FMNH 66888	M	Africa, captive; Chicago Zoological Society
AMNH 113812	?	Africa
AMNH 113811	?	Africa
AMNH 113814	?	Africa
AMNH 113810	?	Africa
Damaliscus lunatus (Group 1)		
BMNH 1886.5.5.10	M	Manyami Valley
BMNH 1886.5.5.11	F	Manyami Valley
AMNH 83526	F	Mababe Flats, Bechuanaland Protectorate
Damaliscus dorcas (Group 1)		
BMNH 1960.70.345	M	Bontobak National Park, S Africa
MCZ 5001	M	South Africa
USNM 175777	M	Northern Natal
USNM 218725	M	Northern Natal
USNM 252810	M	S Africa: Pretoria
USNM 240404	M	National Zoo Park
FMNH 73662	F	S Africa, captive; Chicago Zoological Society
FMNH 53713	M	Africa, captive; Lincoln Park Zoo
AMNH 81728	?	South Africa, near Kroonstad, Orange Free State
AMNH 81787	F	South Africa: Bredasdorp, near Cape Algulhas
AMNH 81727	?	South Africa, near Kroonstad, Orange Free State
AMNH 81729	?	South Africa, near Kroonstad, Orange Free State
AMNH 81786	M	South Africa: Bredasdorp, near Cape Algulhas
AMNH 81785	M	South Africa: Bredasdorp, near Cape Algulhas
Damaliscus korrigum (Group 1)		
USNM 163006	M	British East Africa: Guaso Nyiro, Sotik
USNM 163008	M	British East Africa: Guaso Nyiro, Sotik
USNM 163009	M	British East Africa: Guaso Nyiro, Sotiksptol
FMNH 29531	M	British East Africa: Molo
AMNH 82035	F	Guerametti, Tanganyika

APPENDIX 1—(*Continued*)

AMNH 113781	M	Sudan, Equatorial Province, 10 mi NE of Gorgial
YPM 6070	M	Kenya, Masai, Olkenyie, 35 mi WSW Narok
YPM 5117	F	Kenya, Masai, Olkenyie, 35 mi WSW Narok
MCZ 15727	?	Sudan, Blue Nile, Magangani
MCZ 15724	F	Sudan, Blue Nile, Magangani
AMNH 82034	M	Tanganyika: Guerametti

Damaliscus hunteri (Group 1)

BMNH 1936.3.28.12	M	Jubaland
BMNH 1936.3.28.13	F	Jubaland
BMNH 1938.7.11.1	?	Tana Valley
AMNH 88408	F	British East Africa
AMNH 88406	M	British East Africa

Alcelaphus lichtensteini (Group 1)

BMNH 1940.82	?	Chura, Tanganyika

Alcelaphus buselaphus (Group 1)

MCZ 13676	?	British East Africa
USNM 162996	M	Guaso Nyiro, Sotik, British East Africa
USNM 162997	F	Guaso Nyiro, Sotik, British East Africa
USNM 172905	F	British East Africa, Lake Naivasha
FMNH 1296	F	British Somaliland: Toyo Plain
FMNH 29561	M	Kenya Colony: Molo
FMNH 18813	M	British Somaliland, Toyo Plain
AMNH 83513	M	N'Kate, Bechuanaland Protectorate
AMNH 53427	F	Faradje, Belgian Congo
AMNH 27815	F	Solai, British East Africa
AMNH 82159	M	Lado-Khor, Sulimon, Sudan
AMNH 82033	F	Guerametti, Tanganyika
AMNH 82031	M	Kenya Colony, Rift Valley, British East Africa
YPM 5118	M	Kenya, Isiolo
MCZ 15389	M	Sudan: Dinder River
AMNH 34721	M	Nazi Gish District, British East Africa
AMNH 14443	M	No data

Connochaetes gnou (Group 1)

BMNH 1850.11.22.70	F	S Africa
YPM 753	?	S Africa: Cape Colony
AMNH 81717	?	South Africa: near Kroonstad, Orange Free State
AMNH 81716	?	South Africa: near Kroonstad, Orange Free State

Connochaetes taurinus (Group 1)

MCZ 13677	?	Nairobi Plains
MCZ 5005	?	South Africa
BMNH 1936.3.30.15	M	Zululand
BMNH 1940.83	M	Mahungoi, Tanganyika
BMNH 1932.6.6.27	M	No locality
BMNH 1932.6.6.28	F	No locality
USNM 163011	M	British East Africa: N Guaso Nyiro, Sotik
USNM 163012	M	British East Africa: N Guaso Nyiro, Sotik
USNM 163019	M	British East Africa: N Guaso Nyiro, Sotik
USNM 163020	M	British East Africa: N Guaso Nyiro, Sotik
USNM 164650	F	Lado Enclave: Rhino Camp

APPENDIX 1—(*Continued*)

AMNH 54384	?	Zululand
AMNH 81789	?	Zululand
AMNH 54137	F	East Africa: Simba
AMNH 83502	F	Mababe Flats, Bechuanaland Protectorate
AMNH 83503	F	Mababe Flats, Bechuanaland Protectorate
AMNH 54133	M	Simba, British East Africa
AMNH 81788	?	Zululand
AMNH 82047	M	Tanganyika: Guerametti
AMNH 54385	?	Zululand
AMNH 81784	?	South Africa, Union of South Africa, Cape Province
Ourebia ourebi (Group 2)		
BMNH 1934.5.1.3	M	Mongalla, Sudan
BMNH 1928.8.2.4	?	Montana, Mongolla
AMNH 53328	M	Niangara, Congo
AMNH 82071	F	Tanganyika, N Guerametti
AMNH 34764	M	British East Africa
AMNH 34762	M	British East Africa
AMNH 80258	M	New York Zoo
AMNH 82070	M	Tanganyika, N Guerametti
AMNH 80545	M	Huamba, West Africa
BMNH 1936.3.28.7	M	Jubaland
MCZ 15388	M	Sudan, Blue Nile, Omadurman
MCZ 15319	M	Sudan, Blue Nile, El Gauf
Oreotragus oreotragus (Group 5)		
USNM 314958	M	Kenya: Mt. Auswa
USNM 163024	?	British East Africa: Loita Plains
YPM 5112	M	Kenya, NFD, 10 mi SW Isiolo
FMNH 19580	F	British East Africa: Lukenya Mountain
MCZ 13670	F	British East Africa, Guaso Nyiro
MCZ 14555	M	British East Africa, Guaso Nyiro
AMNH 27827	M	British East Africa, Makuru
AMNH 27826	M	British East Africa, Makuru
AMNH 33327	F	British East Africa, Athai River
AMNH 80553	M	Mossamedes, Angola
YPM 3973	M	Bronx Zoological Park
AMNH 82074	?	British East Africa, Kenya Colony, Livcania
Raphicerus campestris (Group 2)		
AMNH 34728	M	British East Africa, Masin Gishu
AMNH 80538	M	Mossamedes, Angola, West Africa
YPM 5935	F	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
YPM 5113	M	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
YPM 5131	F	Kenya, eastern slopes Aberdare Mts., 10 mi NW Mwiega
MCZ 14552	M	British East Africa, Kapiti Plain
MCZ 13673	M	British East Africa, Kapiti
MCZ 13672	M	British East Africa, Kapiti
YPM 3988	M	Marijo, S Masai Reserve
Nesotragus moschatus (Group 3)		
BMNH 1936.3.30.30	F	Zululand
FMNH 18972	M	Kenya
AMNH 88427	F	Africa: Kenya Colony, Muthaigu

APPENDIX 1—(*Continued*)

AMNH 88426	M	Africa: Kenya Colony, Muthaigu
YPM 3099	F	Kenya, Sokoke Forest, 7 mi NW Kilifi
AMNH 27828	?	Africa: Kenya Colony

Neotragus pygmaeus (Group 3)

MCZ 25401	M	Liberia: Merikay

Neotragus batesi (Group 3)

BMNH 1937.8.4.26	M	Lomie District, Cameroons
BMNH 1937.8.4.27	F	Lomie District, Cameroons
AMNH 53946	M	Medje, Congo
AMNH 53180	M	Medje, Congo
AMNH 53203	F	Poko, Belgian Congo

Madoqua phillipsi (Group 2/3)

BMNH 1895.10.17.3	F	Berbera
BMNH 1895.10.17.2	M	Berbera
BMNH 1936.3.28.6	M	Jubaland

Madoqua guentheri (Group 2/3)

MCZ 50338	F	Kenya: Turicana, Lokori
MCZ 50341	M	Kenya: Turicana, Lokori
MCZ 50339	F	Kenya: Turicana, Lokori
MCZ 14556	?	British East Africa, Guaso Nyiro

Madoqua kirki (Group 2/3)

BMNH 1932.6.6.49	F	Olduvai
BMNH 1932.6.6.51	M	Olduvai
BMNH 1936.5.28.1	F	Olduvai
AMNH 83263	M	British East Africa
AMNH 36353	M	British East Africa
AMNH 87218	M	No data
AMNH 82076	M	Tanganyika: Kilosa
AMNH 27831	M	Nyamusi, British East Africa

Madoqua saltiana (Group 2/3)

BMNH 1935.12.12.5	?	Sudan
BMNH 1869.2.2.10	F	Abyssinia

Dorcatragus megalotis (Group ?)

BMNH 1895.5.2.1	F	50 miles South of Berbera

Antilope cervicapra (Group 1)

BMNH 1914.8.22.1	F	No data; purchased Sir E Lader
BMNH 1862.10.11.4	M	Purchased Zoological Society London
BMNH 1974.414	?	No data
BMNH 1974.413	F	No data
USNM 49717	M	National Park Zoo
USNM 268196	F	National Park Zoo
AMNH 174628	M	National Park Zoo
AMNH 54486	M	Sonaripur, N Kheri Forest

APPENDIX 1—(*Continued*)

Aepyceros melampus (Group 2)

MCZ 13230	M	British East Africa, Guaso Nyiro
MCZ 14221	M	British East Africa, Guaso Nyiro
MCZ 14223	F	British East Africa, Lake Organdos, North of Gilgil
USNM 241588	F	Kondoa Irangi
USNM 163253	F	British East Africa: Guaso Nyiro River
USNM 261111	F	Tanganyika Territory: Tulo
YPM 5116	M	Kenya, Aberdare Mts., 20 mi W Thomson Falls
AMNH 82046	M	Guerametti, Tanganyika
AMNH 83534	F	Mababe Flats, Bechuanaland
AMNH 82047	M	Guerametti, Tanganyika
YPM 3982	M	Marijo, S Masai Reserve
YPM 9513	F	Kenya, E Aberdare Mts., 20 mi W Thomson Falls
YPM 3974	F	Amorro River
AMNH 840F#	M	Congo

Ammodorcas clarkei (Group 2)

BMNH 1935.12.13.5	M	British Somaliland
BMNH 1896.10.6.2	F	Darkor Wells, Somali Haut
BMNH 1935.12.13.6	M	British Somaliland
FMNH 1374	M	British Somaliland, S of Toyo Plain
FMNH 1372	M	As above

Litocranius walleri (Group 2)

BMNH 1936.3.28.3	M	Jubaland
BMNH 1935.7.24.1	M	British Somaliland
USNM 164033	F	Guaso Nyiro
USNM 164034	M	As above
YPM 9478	F	Kenya, Isiolo
YPM 5115	M	Kenya, NFD, 5 mi S Isiolo
YPM 9477	M	Kenya, Isiolo
YPM 3987	M	Saka, on Tana River
MCZ 13231	M	British East Africa, Guaso Nyiro
MCZ 8734	F	British East Africa, junction with Guaso Nyiro, near Mivera River

Gazella subguttorosa (Group 1)

BMNH not reg.	M	Purchased Rowland Ward
FMNH 42719	M	Persia: salt desert near Tehran
FMNH 42718	M	As above
FMNH 84489	M	Iraq: Kirbuk Liwa, Kaua-en-jeer (on Kirkuk-Chemchemal Rd.)

Gazella dorcas (Group 1)

BMNH 1935.12.12.8	?	Hafta, Sudan
BMNH 1850.11.22.54	M	Purchased Zoological Society of London
USNM 241500	M	Private Zoo, D.C.
USNM 395623	M	National Zoological Park

Gazella gazella (Group 1)

MCZ 54414	F	Israel, Ramot Yissakhar
MCZ 54417	M	Israel, Ramot Yissakhar
USNM 252688	F	Sudan: Dalaba

APPENDIX 1—(*Continued*)

FMNH 57942	F	Iran: Fars, 10 mi W Chah Moslem
FMNH 57934	F	Iran: Fars; Jahrom
FMNH 97897	F	Iran: 200 mi SE Tehran
AMNH 54506	F	Bhopal, Sanchi, India
AMNH 54997	M	India, Bikaner Rapputana

Gazella leptoceros (Group 1)

BMNH 1936.3.26.1	M	Tunisia

Gazella pelzelni (Group 1)

BMNH 1935.7.24.3	M	Berbera, British Somaliland
BMNH 1935.7.24.2	M	Berbera, British Somaliland
FMNH 18811	M	Somaliland, Durham

Gazella spekei (Group 1)

USNM 25285	M	Sudan: Gemeisa
FMNH 51519	M	Africa, captive; Chicago Zoological Society

Gazella thomsoni (Group 1)

BMNH 1936.9.5.6	F	Balbal
BMNH 1936.9.5.4	M	Balbal
USNM 172903	M	S Guaso, Nyiro
USNM 163067	F	British East Africa: Guaso, Nyiro River
USNM 164514	M	British East Africa: Sotik, Guaso Nyiro
FMNH 49883	M	Africa, captive; Chicago Zoological Society
YPM 4042	M	No data
YPM 3983	M	Niagara, Masai Reserve
YPM 6068	M	Kenya, eastern slopes Aberdare Mts., 20 mi W Thomson Falls
YPM 6069	M	Kenya, eastern slopes Aberdare Mts., 20 mi W Thomson Falls
YPM 3975	M	Niagara, South Masai Reserve
MCZ 13236	M	British East Africa, Guaso Nyiro, Meni River

Gazella tilonura (Group 1)

BMNH 1873.8.29	?	Abyssinia

Gazella dama (Group 1)

USNM 25440	M	National Zoological Park

Gazella granti (Group 1)

BMNH 1932.6.6.35	M	Mgurugine
BMNH 1936.9.5.1	M	Mgurugine
BMNH 1960.11.10.6	M	Balbal, Tanganyika
BMNH 1932.6.6.34	M	Balbal, Tanganyika
BMNH 1936.3.28.10	M	Jubaland
BMNH 1936.9.5.3	M	Balbal
BMNH 1935.12.14.2	M	Nairobi
MCZ 14560	M	British East Africa, Kapiti Plain
MCZ 13243	F	British East Africa, Guaso Nyiro, near Naka
MCZ 13237	M	British East Africa, Guaso Nyiro, Meni River
MCZ 13236	M	British East Africa, Guaso Nyiro, Meni River

APPENDIX 1—(*Continued*)

MCZ 11106	M	No data
USNM 163083	?	Guaso Nyiro
YPM 6066	M	Kenya, Masai, Olkenyie, 35 mi WSW Narok
FMNH 29605	M	British East Africa: Zukenya Mt.
YPM 6067	F	Kenya, Masai, Olkenyie, 35 mi WSW Narok
YPM 6065	F	Kenya, Masai, Olkenyie, 35 mi WSW Narok
YPM 3998	M	Isiolo, Northern Frontier P.
YPM 3981	F	Saka, on Tana River (NFD)
YPM 3990	M	Dasagera, Africa
MCZ 8034	M	No data
Gazella soemmerringi (Group 1)		
BMNH 1935.12.12.9	?	Sudan
BMNH 1935.12.13.1	M	No locality
MCZ 15697	?	Sudan, Dinder River, El Kuka
FMNH 1369	M	Somaliland: Silo Plain
Gazella cuvieri (Group 1)		
BMNH 39.2563	M	N Africa
BMNH 1866.12.30.24	M	N Africa
Antidorcas marsupialis (Group 1)		
BMNH 11.1912	F	No locality
USNM 256124	M	No history; National Zoological Park
USNM 173040	?	No locality; National Zoological Park
FMNH 34488	F	Bechuanaland: Kalahari Desert, N'Kate
AMNH 81745	F	South Africa, near Kroonstad
AMNH 81744	F	South Africa, near Kroonstad
AMNH 83549	M	South Africa: N'Kate Flats
AMNH 81740	M	South Africa, near Kroonstad
AMNH 81743	M	South Africa, near Kroonstad
AMNH 81739	M	Swak op Mund, South West Africa
AMNH 83550	F	N'Kate, Bechuanaland Protectorate
Procapra guttorosa (Group ?)		
AMNH 46453	F	Mongolia, 120 mi S of Urga
AMNH 46444	F	Mongolia, 80 mi S of Urga
Panthalops hodgsoni (Group ?)		
BMNH 1856.9.22.19	?	Probably Ladak
BMNH 1970.191	?	No data
Saiga tatarica (Group 1)		
MCZ 5007	M	No data
BMNH 1964.6.1.1	M	Russia
AMNH 85305	F	Kazakstan, approx. 250 mi N of Perovesk
Naemorhedus goral (Group 5)		
MCZ 17349	F	China: Hupeh, Ichang Hsien
MCZ 16493	M	Szechuan, Hapek
MCZ 17350	F	China: Hupeh, Ichang Hsien
MCZ 17348	M	China: Hupeh, Ichang Hsien

APPENDIX 1—(*Continued*)

MCZ 16492	F	Szechuan, Hapek
BMNH 1927.2.7.7	?	Kathai Mullah, Kaj-i-nog, W Kashmir
USNM 259023	F	Szechuan: Mupien
USNM 259398	M	Szechuan: Wen Chuan
AMNH 43001bis	M	Cheria, Yunnan Province, Lichiang
AMNH 43001	M	Cheria, Yunnan Province, Lichiang
AMNH 110481	M	West China, Wenchuan
AMNH 43004	M	Cheria, Yunnan Province, Lichiang
USNM 259399	F	Szechuan: Wen Chuan

Capricornis sumatraensis (Group 5)

MCZ 17345	M	
MCZ 13247	M	China, West Szechuan
BMNH 1937.2.10.1	M	Purchase Zoological Society
USNM 258653	F	Szechuan: Wen Chuan
USNM 258670	M	Szechuan: Wen Chuan
USNM 259025	F	Szechuan, Mupien
AMNH 54614	F	India: Kashmir Valley, Chasma Shaki
AMNH 43037	M	China: Yunnan Province, Lichiang

Capricornis crispus (Group 5)

USNM 311229	?	Formosa: Puli
AMNH 165683	F	Japan: Honishu Island, Yamagata District
AMNH 165685	F	Japan: Honishu Island, Wakayama District

Rupicapra rupicapra (Group 5)

BMNH 1892.3.16.8	M	Caucasus
BMNH 1886.12.27.1	?	Hartszog, S Carpathians
BMNH 631G	M	No locality
FMNH 46402	M	Poland: Zakopane, National Park
AMNH 90235	M	Switzerland: Roseg Valley
AMNH 90234	M	Switzerland: Roseg Valley
AMNH 90236	M	Switzerland: Roseg Valley

Oreamnos americanus (Group 5)

USNM 35942	M	No data
AMNH 128105	M	Alaska

Budorcas taxicolor (Group 5)

BMNH 1918.6.15.1	M	Ghasa, NW Bhutan
BMNH 1885.8.1.367	?	Mishimi Hills
BMNH 1935.10.4.1	?	No locality
AMNH 57017	F	Tsing Ling Shan, Tai Pei Shan, Shensi
USNM 259079	M	Szechuan

Ovibos moschatus (Group 5)

USNM 5094	?	East of Fort Good Hope
USNM 288025	?	Alaska, Nunivak Island
USNM 49655	F	Ellumiri Land, Buehanan Bay
USNM 251592	M	NE Greenland: Loch Fineljord
USNM 256969	?	No data
USNM 261802	M	NE Greenland: Loch Fineljord

APPENDIX 1—(*Continued*)

USNM 261803	M	NE Greenland: Loch Fineljord
FMNH 57621	F	No data

Hemitragus hylocrius (Group 5)

BMNH 1936.3.2.1	M	Bangi Tappal, S India
AMNH 54755	M	India: Kodaikania, Madura District
AMNH 54757	F	India: Kodaikania, Madura District
AMNH 54758	F	India: Kodaikania, Madura District
AMNH 54857	F	India: Kodaikania, Madura District

Capra hircus aegarus (Group 5)

FMNH 97931	F	Iran: Damghan Mts.

Capra pyrenaica (Group 5)

MANH 163840	M	Spain
AMNH 163842	M	Spain

Capra ibex (Group 5)

BMNH 1902.3.9.3	M	Lower Kok-su, Tien Shan
AMNH 54906	M	Tien Shan Mts.
AMNH 54908	M	Tien Shan Mts.
AMNH 54914	M	Tien Shan Mts.
AMNH 54907	M	Tien Shan Mts.
AMNH 54910	F	Tien Shan Mts.
AMNH 54902	F	Tien Shan Mts.
AMNH 147184	M	Switzerland: Pontresina
AMNH 57307	F	Mongolia: Arsta Bogola
AMNH 54909	M	Thian Shan Mts.

Capra caucasica (Group 5)

BMNH 1892.3.16.1	M	Western Caucasus

Capra falconeri (Group 5)

MCZ 5150	F	No data

Pseudois nayuar (Group 5)

BMNH 1845.1.12.450	U	Nepal Frontier
USNM 84082	M	Iadak: Archuse Nullah, Hanli River
USNM 84089	M	Archuse: Nullah, Hanli River

Ammotragus lervia (Group 5)

YPM 4485	M	A. G. Gilbert Estate, Hamden, Ct.
MCZ 38315	U	Pittsburgh Zoo
BMNH 1856.12.30.2	F	No locality
FMNH 52423	M	Africa (captive) Chicago Zoological Society

Ovis musimon (Group 4)

BMNH 1895.4.4.1	M	Genargenta Range, Sardinia
FMNH 101778	F	France: Corsica, Rachelwood Preserve

APPENDIX 1—(*Continued*)

Ovis orientalis (Group 4)

MCZ 6030	M	NW India
USNM 37934	M	Baltistan: Shigar Valley
FMNH 58045	F	Iran: Protected Region; Lake Rezaiyeh, Goyoon
FMNH 58035	M	Iran: Marakan Protected Region
FMNH 97983	M	Iran: Baluchistan, 45 km SW Iranskahr
FMNH 97974	M	Iran: Damghan Mountains
FMNH 97948	F	Iran: Khorassan; Shahrabad
FMNH 97944	F	Iran: Tehran
FMNH 98123	F	Iran: Mazanderan
AMNH 119526	M	India: Punjab

Ovis ammon (Group 4)

YPM 6229	M	Russian Pamirs
BMNH 1856.9.22.18	U	Lodak
BMNH 1898.2.6.9	U	Altai
AMNH 54875	F	Russian Pamirs
AMNH 54873	M	Russian Pamirs
AMNH 54872	M	Russian Pamirs
AMNH 54888	M	Russian Pamirs
AMNH 45490	M	China: Kwei Chua Cheng
AMNH 54884	M	Russian Pamirs
AMNH 54867	M	Russian Pamirs
AMNH 54882	M	Russian Pamirs
AMNH 54868	M	Russian Pamirs
AMNH 54869	M	Russian Pamirs
AMNH 54865	M	Russian Pamirs
AMNH 54870	M	Russian Pamirs

Ovis canadensis (Group 5)

MCZ 1774	F	Percy, Carbon County, Wyoming
USNM 274694	M	Nevada Desert Game Range, Dodge County
USNM 274704	M	Nevada Desert Game Range, Dodge County
USNM 274706	M	Nevada Desert Game Range, Dodge County
USNM 171884	U	Yellowstone National Park
YPM 1490	M	Sherman Station, Wyoming
FMNH 18846	U	Lincoln Park Zoo
AMNH 139949	M	Alberta, near Smokey River, Jasper Park
AMNH 139948	M	Alberta, near Smokey River, Jasper Park
AMNH 163829	M	New Mexico, Big Hatchet Mts.
AMNH 163828	F	New Mexico, Big Hatchet Mts.
AMNH 18213	F	Siberia: Gichiga

Ovis dalli (Group 5)

USNM 257512	M	Alaska, White River, Francis Creek
FMNH 57630	F	Captive, Chicago Zoological Society
AMNH 125579	F	Alaska: Kenai Penninsula
AMNH 123043	M	Northwest Territory: Nahanni River
AMNH 123044	M	Northwest Territory: Nahanni River
AMNH 123049	M	British Columbia, East of Tuchodi Lake
AMNH 21817	M	British Columbia, East of Tuchodi Lake
AMNH 125397	M	British Columbia, 121 mi NW Hudson Hope
AMNH 128464	M	British Columbia
AMNH 123042	F	Northwest Territory: Nahanni River

APPENDIX 2: MEASUREMENTS (IN CENTIMETERS) OF LIMB BONES OF BOVIDAE

(The number of specimens, the mean plus or minus one standard deviation, and the observed range in parentheses are given for each measurement, listed by species.)

Tragelaphus angasi

H1	4	20.12 ± 2.425	(16.50–21.60)
H2	4	22.20 ± 2.535	(18.40–23.60)
H3	4	4.49 ± 0.490	(3.79–4.90)
H4	4	3.96 ± 0.312	(3.52–4.24)
H5	4	4.50 ± 0.387	(3.98–4.88)
H6	4	1.67 ± 0.220	(1.50–1.96)
H7	4	2.26 ± 0.173	(2.01–2.39)
H8	4	2.71 ± 0.337	(2.22–2.98)
U1	4	29.47 ± 3.428	(24.50–32.10)
U2	4	6.09 ± 0.698	(5.06–6.58)
R1	4	23.42 ± 2.541	(19.80–25.50)
R2	4	4.08 ± 0.305	(3.63–4.26)
R3	4	2.26 ± 0.215	(1.95–2.41)
R4	4	4.39 ± 0.379	(3.83–4.62)
R5	4	3.97 ± 0.437	(3.33–4.26)
R6	4	2.74 ± 0.240	(2.39–2.91)
R7	4	1.57 ± 0.190	(1.30–1.73)
MC1	4	23.10 ± 1.715	(20.70–24.70)
MC2	4	3.18 ± 0.248	(2.84–3.38)
MC3	4	2.12 ± 0.197	(1.84–2.28)
MC4	4	2.87 ± 0.212	(2.56–3.00)
MC5	4	2.21 ± 0.191	(1.93–2.36)
MC6	4	1.88 ± 0.187	(1.61–2.03)
MC7	4	1.82 ± 0.175	(1.58–1.97)
F1	4	27.87 ± 2.973	(23.50–30.00)
F2	4	6.71 ± 0.724	(5.64–7.16)
F3	4	5.59 ± 0.658	(4.65–6.07)
F4	4	2.61 ± 0.192	(2.33–2.74)
F5	4	5.10 ± 0.452	(4.43–5.41)
F6	4	2.48 ± 0.228	(2.17–2.70)
F7	4	2.81 ± 0.298	(2.43–3.15)
T1	4	31.25 ± 2.924	(26.90–33.20)
T2	4	6.18 ± 0.524	(5.41–6.54)
T3	4	3.94 ± 0.371	(3.49–4.19)
T4	4	3.87 ± 0.324	(3.41–4.17)
T5	4	2.77 ± 0.214	(2.46–2.92)
T6	4	2.59 ± 0.216	(2.28–2.78)
T7	4	2.22 ± 0.204	(1.94–2.41)
MT1	4	24.02 ± 1.775	(21.60–25.40)
MT2	4	2.93 ± 0.184	(2.66–3.06)
MT3	4	2.96 ± 0.174	(2.76–3.11)
MT4	4	2.93 ± 0.214	(2.62–3.07)
MT5	4	2.04 ± 0.160	(1.84–2.23)
MT6	4	1.93 ± 0.147	(1.71–2.01)
MT7	4	2.14 ± 0.218	(1.86–2.32)
S1	1	25.40	

Tragelaphus buxtoni

H1	5	25.24 ± 2.669	(22.80–28.80)
H2	5	28.04 ± 2.776	(25.30–31.50)
H3	5	5.72 ± 0.450	(5.10–6.17)
H4	5	5.28 ± 0.430	(4.79–5.73)
H5	5	6.01 ± 0.592	(5.36–6.58)
H6	5	2.26 ± 0.233	(1.96–2.57)
H7	5	3.02 ± 0.309	(2.68–3.37)
H8	5	3.56 ± 0.418	(3.06–4.00)
U1	5	34.28 ± 3.373	(30.40–38.60)
U2	5	7.48 ± 1.033	(6.22–8.77)
R1	5	26.32 ± 2.146	(23.70–29.00)
R2	5	5.46 ± 0.524	(4.97–6.11)
R3	5	2.93 ± 0.390	(2.51–3.52)
R4	5	5.82 ± 0.616	(5.16–6.50)
R5	5	5.29 ± 0.631	(4.56–5.96)
R6	5	3.55 ± 0.381	(3.14–4.00)
R7	5	1.93 ± 0.308	(1.55–2.25)
MC1	5	24.62 ± 1.730	(22.60–26.80)
MC2	5	4.11 ± 0.404	(3.68–4.56)
MC3	5	2.72 ± 0.213	(2.50–2.98)
MC4	5	3.98 ± 0.429	(3.44–4.40)
MC5	5	2.68 ± 0.297	(2.30–3.00)
MC6	5	2.47 ± 0.269	(2.17–2.81)
MC7	5	2.32 ± 0.182	(2.17–2.62)
F1	5	34.46 ± 2.827	(31.30–37.90)
F2	5	8.68 ± 0.883	(7.47–9.34)
F3	5	6.70 ± 0.520	(6.11–7.52)
F4	5	3.62 ± 0.297	(3.25–4.06)
F5	5	6.99 ± 0.537	(6.38–7.69)
F6	5	3.15 ± 0.309	(2.75–3.50)
F7	5	3.34 ± 0.219	(3.06–3.54)
T1	5	36.60 ± 3.236	(33.30–41.10)
T2	5	8.34 ± 0.655	(7.60–9.24)
T3	5	5.23 ± 0.557	(4.56–5.81)
T4	5	5.35 ± 0.504	(4.84–5.91)
T5	5	3.89 ± 0.328	(3.54–4.35)
T6	5	3.25 ± 0.308	(2.93–3.63)
T7	5	3.03 ± 0.506	(2.61–3.79)
MT1	5	25.02 ± 1.946	(22.60–27.30)
MT2	5	3.91 ± 0.306	(3.62–4.36)
MT3	5	3.87 ± 0.327	(3.46–4.29)
MT4	5	4.17 ± 0.351	(3.71–4.49)
MT5	5	2.73 ± 0.200	(2.56–3.03)
MT6	5	2.43 ± 0.205	(2.20–2.73)
MT7	5	2.53 ± 0.172	(2.35–2.75)
S1	5	29.40 ± 2.875	(26.20–33.30)

Tragelaphus spekei

H1	9	22.77 ± 2.201	(18.50–25.20)
H2	9	24.88 ± 2.159	(20.40–27.40)
H3	9	4.32 ± 0.433	(3.65–4.90)
H4	9	3.89 ± 0.314	(3.23–4.19)

APPENDIX 2—(*Continued*)

H5	9	4.33 ± 0.371	(3.55–4.79)
H6	9	1.51 ± 0.185	(1.18–1.83)
H7	9	2.31 ± 0.254	(1.78–2.60)
H8	9	2.81 ± 0.273	(2.25–3.17)
U1	9	29.26 ± 2.611	(23.80–33.70)
U2	9	5.44 ± 0.584	(4.19–6.05)
R1	9	23.20 ± 2.089	(19.00–26.90)
R2	9	3.92 ± 0.324	(3.33–4.30)
R3	9	2.21 ± 0.236	(1.78–2.56)
R4	9	4.18 ± 0.344	(3.58–4.65)
R5	9	3.98 ± 0.341	(3.29–4.51)
R6	9	2.62 ± 0.249	(2.20–2.99)
R7	9	1.73 ± 0.184	(1.41–2.05)
MC1	9	21.76 ± 1.826	(18.50–25.10)
MC2	9	3.17 ± 0.279	(2.68–3.53)
MC3	9	2.06 ± 0.222	(1.71–2.36)
MC4	9	3.04 ± 0.120	(2.67–3.27)
MC5	9	2.09 ± 0.176	(1.77–2.31)
MC6	9	2.09 ± 0.186	(1.76–2.37)
MC7	9	1.68 ± 0.151	(1.36–1.86)
F1	9	29.95 ± 2.399	(25.30–33.90)
F2	9	7.32 ± 0.815	(5.76–8.36)
F3	9	6.04 ± 0.824	(4.35–6.89)
F4	9	2.47 ± 0.219	(2.08–2.77)
F5	9	5.00 ± 0.345	(4.26–5.38)
F6	9	2.54 ± 0.307	(2.14–3.22)
F7	9	2.86 ± 0.408	(2.23–3.56)
T1	9	34.84 ± 2.951	(28.60–39.20)
T2	9	6.10 ± 0.450	(5.28–6.79)
T3	9	4.22 ± 0.350	(3.73–4.65)
T4	9	3.82 ± 0.290	(3.32–4.17)
T5	9	2.96 ± 0.236	(2.64–3.37)
T6	9	2.63 ± 0.250	(2.16–3.08)
T7	9	2.22 ± 0.229	(1.90–2.59)
MT1	9	23.98 ± 2.127	(20.20–28.00)
MT2	9	2.91 ± 0.181	(2.62–3.18)
MT3	9	2.83 ± 0.202	(2.50–3.20)
MT4	9	3.27 ± 0.229	(2.85–3.51)
MT5	9	2.14 ± 0.205	(1.80–2.45)
MT6	9	2.06 ± 0.161	(1.82–2.36)
MT7	9	1.97 ± 0.188	(1.67–2.29)
S1	4	22.20 ± 3.224	(17.50–24.40)

Tragelaphus scriptus

H1	6	16.92 ± 1.468	(14.90–18.73)
H2	6	18.68 ± 1.664	(16.40–20.92)
H3	6	3.34 ± 0.380	(2.73–3.76)
H4	6	3.05 ± 0.296	(2.60–3.37)
H5	6	3.43 ± 0.368	(2.93–3.84)
H6	6	1.15 ± 0.170	(0.95–1.36)
H7	6	1.71 ± 0.183	(1.42–1.92)
H8	6	2.21 ± 0.278	(1.78–2.58)
U1	6	22.90 ± 2.265	(19.50–25.93)
U2	6	4.42 ± 0.633	(3.42–5.19)
R1	6	18.27 ± 1.704	(15.80–20.53)
R2	6	3.10 ± 0.350	(2.64–3.46)
R3	6	1.72 ± 0.178	(1.43–1.93)
R4	6	3.34 ± 0.426	(2.83–3.89)
R5	6	3.05 ± 0.315	(2.60–3.40)
R6	6	2.27 ± 0.280	(1.82–2.56)
R7	6	1.26 ± 0.149	(1.06–1.51)
MC1	6	17.64 ± 1.035	(16.20–19.08)
MC2	6	2.38 ± 0.147	(2.20–2.53)
MC3	6	1.59 ± 0.095	(1.46–1.70)
MC4	6	2.20 ± 0.188	(1.88–2.37)
MC5	6	1.61 ± 0.112	(1.44–1.75)
MC6	6	1.57 ± 0.160	(1.33–1.79)
MC7	6	1.40 ± 0.116	(1.27–1.54)
F1	6	23.23 ± 2.094	(20.20–25.71)
F2	6	5.53 ± 0.766	(4.49–6.52)
F3	6	4.32 ± 0.374	(3.71–4.66)
F4	6	2.05 ± 0.220	(1.72–2.27)
F5	6	4.18 ± 0.351	(3.69–4.52)
F6	6	2.05 ± 0.210	(1.79–2.35)
F7	6	2.24 ± 0.299	(1.77–2.54)
T1	6	25.99 ± 2.070	(22.80–28.55)
T2	6	4.99 ± 0.393	(4.42–5.55)
T3	6	3.17 ± 0.316	(2.70–3.68)
T4	6	3.19 ± 0.323	(2.78–3.67)
T5	6	2.41 ± 0.191	(2.16–2.60)
T6	6	2.17 ± 0.208	(1.85–2.47)
T7	6	1.99 ± 0.247	(1.53–2.20)
MT1	6	18.89 ± 1.084	(17.20–20.37)
MT2	6	2.31 ± 0.148	(2.14–2.48)
MT3	6	2.33 ± 0.179	(2.13–2.58)
MT4	6	2.36 ± 0.193	(2.06–2.58)
MT5	6	1.70 ± 0.123	(1.51–1.87)
MT6	6	1.61 ± 0.163	(1.40–1.86)
MT7	6	1.72 ± 0.162	(1.49–1.88)
S1	5	17.90 ± 1.935	(15.00–20.00)

Tragelaphus imberbis

H1	6	18.25 ± 1.576	(16.70–21.00)
H2	6	20.28 ± 1.641	(18.60–23.10)
H3	6	4.18 ± 0.565	(3.54–4.84)
H4	6	3.71 ± 0.308	(3.28–4.07)
H5	6	4.23 ± 0.419	(3.74–4.78)
H6	6	1.36 ± 0.187	(1.21–1.70)
H7	6	2.10 ± 0.273	(1.70–2.55)
H8	6	2.49 ± 0.246	(2.24–2.92)
U1	6	28.51 ± 2.666	(26.40–33.80)
U2	6	5.28 ± 0.588	(4.73–6.25)
R1	6	23.15 ± 2.091	(21.60–27.30)
R2	6	3.89 ± 0.343	(3.42–4.34)
R3	6	2.09 ± 0.261	(1.80–2.50)
R4	6	4.19 ± 0.452	(3.59–4.65)
R5	6	3.87 ± 0.383	(3.40–4.24)
R6	6	2.38 ± 0.251	(2.06–2.74)
R7	6	1.53 ± 0.152	(1.30–1.74)
MC1	6	24.40 ± 2.106	(22.00–28.10)

APPENDIX 2—(*Continued*)

MC2	6	3.12 ± 0.306	(2.74–3.45)
MC3	6	2.06 ± 0.133	(1.90–2.21)
MC4	6	2.79 ± 0.313	(2.37–3.10)
MC5	6	2.03 ± 0.190	(1.82–2.34)
MC6	6	1.79 ± 0.172	(1.62–2.10)
MC7	6	1.69 ± 0.209	(1.44–2.05)
F1	6	25.58 ± 1.996	(24.00–29.20)
F2	6	6.58 ± 0.582	(5.77–7.15)
F3	6	5.07 ± 0.505	(4.45–5.75)
F4	6	2.51 ± 0.332	(2.20–3.12)
F5	6	5.07 ± 0.671	(4.45–6.29)
F6	6	2.24 ± 0.213	(1.93–2.52)
F7	6	2.60 ± 0.370	(2.18–3.28)
T1	6	29.38 ± 2.363	(27.90–33.90)
T2	6	5.85 ± 0.353	(5.40–6.17)
T3	6	3.92 ± 0.452	(3.39–4.45)
T4	6	3.76 ± 0.256	(3.47–4.09)
T5	6	2.87 ± 0.220	(2.59–3.08)
T6	6	2.50 ± 0.251	(2.23–2.94)
T7	6	2.16 ± 0.288	(1.83–2.64)
MT1	6	25.45 ± 2.040	(23.20–29.10)
MT2	6	2.81 ± 0.227	(2.55–3.10)
MT3	6	2.83 ± 0.293	(2.52–3.32)
MT4	6	2.86 ± 0.242	(2.55–3.24)
MT5	6	2.10 ± 0.142	(1.94–2.35)
MT6	6	1.77 ± 0.138	(1.60–1.94)
MT7	6	2.07 ± 0.204	(1.92–2.46)
S1	3	24.26 ± 4.752	(19.60–29.10)

Tragelaphus strepsiceros

H1	9	25.94 ± 1.598	(24.10–28.70)
H2	9	28.90 ± 1.693	(26.70–31.70)
H3	9	6.07 ± 0.491	(5.32–6.88)
H4	9	5.69 ± 0.403	(5.05–6.24)
H5	9	6.09 ± 0.445	(5.52–6.78)
H6	9	2.01 ± 0.122	(1.90–2.26)
H7	9	3.18 ± 0.438	(2.70–3.99)
H8	9	4.07 ± 0.382	(3.61–4.68)
U1	9	37.60 ± 3.196	(33.00–42.60)
U2	9	8.48 ± 0.865	(7.20–9.33)
R1	9	29.90 ± 2.820	(26.50–34.40)
R2	9	5.76 ± 0.474	(5.03–6.59)
R3	9	3.02 ± 0.313	(2.62–3.44)
R4	9	6.23 ± 0.622	(5.26–7.27)
R5	9	5.62 ± 0.579	(4.74–6.54)
R6	9	4.06 ± 0.428	(3.64–4.61)
R7	9	2.27 ± 0.291	(1.90–2.75)
MC1	9	28.58 ± 3.216	(25.30–33.80)
MC2	9	4.39 ± 0.372	(3.85–4.90)
MC3	9	2.94 ± 0.246	(2.59–3.32)
MC4	9	4.13 ± 0.306	(3.67–4.59)
MC5	9	2.94 ± 0.357	(2.43–3.57)
MC6	9	2.75 ± 0.258	(2.34–3.14)
MC7	9	2.48 ± 0.276	(2.18–2.97)
F1	9	35.25 ± 2.437	(32.40–39.60)
F2	9	9.42 ± 0.909	(8.22–10.74)
F3	9	6.80 ± 0.460	(6.10–7.46)
F4	9	3.40 ± 0.315	(2.96–3.81)
F5	9	6.95 ± 0.540	(6.28–7.74)
F6	9	3.23 ± 0.399	(2.73–3.83)
F7	9	3.56 ± 0.411	(3.16–4.19)
T1	9	38.52 ± 2.515	(35.70–43.20)
T2	9	8.25 ± 0.727	(7.34–9.37)
T3	9	5.13 ± 0.582	(4.50–5.88)
T4	9	5.30 ± 0.450	(4.54–5.91)
T5	9	3.94 ± 0.310	(3.64–4.51)
T6	9	3.53 ± 0.443	(3.09–4.22)
T7	9	2.93 ± 0.335	(2.62–3.55)
MT1	9	29.06 ± 2.945	(25.90–33.70)
MT2	9	3.90 ± 0.273	(3.57–4.37)
MT3	9	3.96 ± 0.361	(3.52–4.58)
MT4	9	4.05 ± 0.295	(3.59–4.55)
MT5	9	2.76 ± 0.271	(2.40–3.34)
MT6	9	2.55 ± 0.236	(2.26–2.98)
MT7	9	2.76 ± 0.284	(2.43–3.21)
S1	5	33.68 ± 2.682	(29.80–37.20)

Tragelaphus euryceros

H1	12	24.44 ± 2.204	(21.70–29.40)
H2	12	27.70 ± 2.575	(24.90–33.40)
H3	12	6.33 ± 0.737	(5.52–7.80)
H4	12	5.61 ± 0.479	(5.02–6.48)
H5	12	6.29 ± 0.556	(5.65–7.56)
H6	12	2.29 ± 0.271	(1.87–2.84)
H7	12	3.32 ± 0.271	(2.89–3.80)
H8	12	3.82 ± 0.347	(3.28–4.47)
U1	12	31.62 ± 2.497	(28.50–36.60)
U2	12	7.75 ± 0.714	(6.78–9.40)
R1	12	23.88 ± 1.731	(21.60–27.60)
R2	12	5.57 ± 0.428	(5.03–6.32)
R3	12	2.92 ± 0.266	(2.66–3.52)
R4	12	5.98 ± 0.525	(5.41–6.86)
R5	12	5.62 ± 0.478	(4.80–6.65)
R6	12	3.78 ± 0.359	(3.30–4.50)
R7	12	2.33 ± 0.239	(1.85–2.78)
MC1	12	19.34 ± 1.351	(17.30–21.50)
MC2	12	4.40 ± 0.306	(3.99–4.90)
MC3	12	2.77 ± 0.259	(2.43–3.25)
MC4	12	4.28 ± 0.359	(3.79–4.93)
MC5	12	2.73 ± 0.229	(2.37–3.19)
MC6	12	2.87 ± 0.245	(2.55–3.39)
MC7	12	2.16 ± 0.152	(1.97–2.50)
F1	12	34.78 ± 2.789	(31.20–41.50)
F2	12	10.36 ± 0.915	(8.90–11.95)
F3	12	7.59 ± 0.717	(6.40–9.27)
F4	12	3.67 ± 0.388	(3.05–4.40)
F5	12	7.32 ± 0.726	(6.46–8.85)
F6	12	3.42 ± 0.300	(2.96–3.91)
F7	12	4.19 ± 0.214	(3.93–4.67)
T1	12	34.02 ± 2.662	(30.30–39.60)
T2	12	8.63 ± 0.628	(7.77–10.01)
T3	12	5.12 ± 0.475	(4.62–6.00)

APPENDIX 2—(*Continued*)

T4	12	5.33 ± 0.429	(4.75–6.21)
T5	12	4.12 ± 0.310	(3.71–4.69)
T6	12	3.75 ± 0.269	(3.33–4.23)
T7	12	3.52 ± 0.336	(2.76–4.02)
MT1	12	21.41 ± 1.506	(19.20–24.30)
MT2	12	4.13 ± 0.277	(3.78–4.60)
MT3	12	3.86 ± 0.359	(3.33–4.51)
MT4	12	4.37 ± 0.300	(3.88–4.89)
MT5	12	2.80 ± 0.236	(2.39–3.23)
MT6	12	2.81 ± 0.215	(2.52–3.26)
MT7	12	2.70 ± 0.182	(2.43–3.02)
S1	10	31.00 ± 2.910	(27.40–35.80)

Taurotragus oryx

H1	4	27.95 ± 2.260	(26.00–31.00)
H2	4	31.65 ± 2.694	(29.50–35.40)
H3	4	7.15 ± 0.743	(6.72–8.27)
H4	4	7.21 ± 0.293	(6.94–7.60)
H5	4	8.64 ± 0.919	(7.91–9.98)
H6	4	3.26 ± 0.200	(3.05–3.52)
H7	4	3.78 ± 0.539	(3.34–4.56)
H8	4	4.78 ± 0.769	(4.21–5.89)
U1	4	38.05 ± 2.076	(36.30–40.80)
U2	4	10.64 ± 1.411	(9.64–12.68)
R1	4	29.10 ± 1.086	(28.00–30.60)
R2	4	7.63 ± 0.397	(7.38–8.23)
R3	4	4.24 ± 0.488	(3.95–4.97)
R4	4	8.69 ± 0.771	(8.15–9.84)
R5	4	7.10 ± 0.809	(6.50–8.29)
R6	4	4.22 ± 0.769	(3.66–5.36)
R7	4	2.53 ± 0.307	(2.32–2.99)
MC1	4	25.25 ± 0.387	(24.90–25.80)
MC2	4	5.66 ± 0.345	(5.28–6.11)
MC3	4	3.43 ± 0.279	(3.16–3.82)
MC4	4	5.48 ± 0.506	(5.01–6.20)
MC5	4	3.29 ± 0.155	(3.19–3.52)
MC6	4	3.30 ± 0.528	(2.89–4.08)
MC7	4	2.62 ± 0.302	(2.46–3.08)
F1	4	38.10 ± 2.224	(36.60–41.40)
F2	4	11.66 ± 1.735	(10.42–14.13)
F3	4	7.96 ± 0.892	(7.14–9.10)
F4	4	4.06 ± 0.191	(3.89–4.29)
F5	4	8.37 ± 0.410	(7.97–8.75)
F6	4	3.75 ± 0.522	(3.29–4.50)
F7	4	4.47 ± 0.466	(4.09–5.15)
T1	4	37.27 ± 1.750	(36.00–39.80)
T2	4	10.37 ± 0.597	(9.89–11.24)
T3	4	5.90 ± 0.506	(5.57–6.65)
T4	4	6.49 ± 0.470	(6.12–7.18)
T5	4	4.77 ± 0.279	(4.55–5.18)
T6	4	4.16 ± 0.484	(3.81–4.88)
T7	4	3.27 ± 0.542	(2.99–4.09)
MT1	4	27.20 ± 0.535	(26.60–27.90)
MT2	4	4.81 ± 0.223	(4.56–5.08)
MT3	4	4.78 ± 0.290	(4.52–5.19)
MT4	4	5.20 ± 0.405	(4.77–5.74)
MT5	4	3.27 ± 0.204	(3.03–3.52)
MT6	4	2.91 ± 0.299	(2.74–3.36)
MT7	4	2.99 ± 0.324	(2.77–3.47)
S1	2	37.35 ± 6.010	(33.10–41.60)

Taurotragus derbianus

H1	6	31.25 ± 1.471	(29.70–33.20)
H2	6	34.91 ± 1.857	(33.20–37.70)
H3	6	7.97 ± 0.410	(7.43–8.45)
H4	6	7.70 ± 0.274	(7.42–8.09)
H5	6	8.75 ± 0.468	(8.36–9.44)
H6	6	2.88 ± 0.134	(2.65–3.00)
H7	6	4.72 ± 0.412	(4.24–5.40)
H8	6	5.23 ± 0.571	(4.53–6.25)
U1	6	45.35 ± 2.216	(43.00–48.20)
U2	6	11.19 ± 0.934	(10.40–12.45)
R1	6	34.88 ± 1.879	(32.40–37.00)
R2	6	8.07 ± 0.383	(7.66–8.54)
R3	6	4.27 ± 0.275	(3.89–4.60)
R4	6	8.73 ± 0.512	(8.18–9.39)
R5	6	8.51 ± 0.799	(7.85–9.64)
R6	6	5.16 ± 0.508	(4.66–5.82)
R7	6	3.02 ± 0.256	(2.72–3.36)
MC1	6	29.30 ± 0.927	(28.20–30.50)
MC2	6	6.22 ± 0.248	(6.00–6.63)
MC3	6	3.79 ± 0.203	(3.57–4.09)
MC4	6	5.73 ± 0.300	(5.36–6.11)
MC5	6	3.58 ± 0.195	(3.41–3.92)
MC6	6	3.70 ± 0.354	(3.39–4.16)
MC7	6	3.08 ± 0.291	(2.85–3.50)
F1	6	41.98 ± 1.975	(40.10–44.70)
F2	6	12.11 ± 0.291	(11.95–12.69)
F3	6	8.49 ± 0.737	(7.74–9.63)
F4	6	4.53 ± 0.263	(4.22–4.88)
F5	6	9.06 ± 0.494	(8.56–9.70)
F6	6	4.46 ± 0.331	(4.06–4.86)
F7	6	4.95 ± 0.397	(4.50–5.58)
T1	6	41.48 ± 1.730	(39.70–43.80)
T2	6	11.16 ± 0.671	(10.34–12.04)
T3	6	6.42 ± 0.421	(5.78–6.90)
T4	6	6.94 ± 0.410	(6.32–7.38)
T5	6	4.98 ± 0.223	(4.75–5.30)
T6	6	4.70 ± 0.413	(4.32–5.33)
T7	6	3.98 ± 0.577	(3.59–5.09)
MT1	6	29.93 ± 1.013	(28.70–31.20)
MT2	6	5.07 ± 0.162	(4.88–5.28)
MT3	6	5.19 ± 0.202	(5.06–5.60)
MT4	6	5.65 ± 0.281	(5.30–6.04)
MT5	6	3.46 ± 0.176	(3.20–3.73)
MT6	6	3.42 ± 0.266	(3.14–3.77)
MT7	6	3.52 ± 0.283	(3.21–3.87)
S1	4	40.95 ± 2.532	(38.50–44.50)

Boselaphus tragocamelus

H1	5	24.02 ± 1.096	(22.60–25.30)

APPENDIX 2—(*Continued*)

H2	5	26.92 ± 0.841	(25.80–27.80)
H3	5	5.66 ± 0.202	(5.38–5.89)
H4	5	5.63 ± 0.430	(5.24–6.17)
H5	5	6.13 ± 0.475	(5.73–6.92)
H6	5	2.00 ± 0.286	(1.72–2.48)
H7	5	3.18 ± 0.249	(2.94–3.49)
H8	5	3.80 ± 0.387	(3.47–4.23)
U1	5	36.88 ± 1.979	(34.70–39.60)
U2	5	8.37 ± 0.741	(7.52–9.43)
R1	5	28.64 ± 1.297	(26.90–30.00)
R2	5	5.60 ± 0.404	(5.25–6.08)
R3	5	3.13 ± 0.289	(2.79–3.55)
R4	5	6.25 ± 0.465	(5.75–6.81)
R5	5	5.66 ± 0.454	(5.12–6.13)
R6	5	3.66 ± 0.319	(3.35–4.04)
R7	5	2.60 ± 1.149	(1.86–4.62)
MC1	5	24.94 ± 1.078	(23.40–26.30)
MC2	5	4.48 ± 0.300	(4.19–4.93)
MC3	5	2.70 ± 0.217	(2.52–3.06)
MC4	5	4.38 ± 0.505	(3.86–5.16)
MC5	5	3.01 ± 0.277	(2.80–3.46)
MC6	5	2.80 ± 0.364	(2.48–3.33)
MC7	5	2.17 ± 0.174	(1.98–2.43)
F1	5	32.58 ± 1.580	(30.50–34.30)
F2	5	9.34 ± 0.721	(8.47–10.40)
F3	5	6.85 ± 0.520	(6.29–7.43)
F4	5	3.56 ± 0.219	(3.40–3.92)
F5	5	6.91 ± 0.424	(6.28–7.34)
F6	5	3.15 ± 0.253	(2.91–3.54)
F7	5	3.51 ± 0.314	(3.02–3.79)
T1	5	33.96 ± 1.635	(31.80–36.00)
T2	5	8.23 ± 0.460	(7.73–8.84)
T3	5	4.85 ± 0.499	(4.24–5.38)
T4	5	5.05 ± 0.321	(4.76–5.56)
T5	5	3.85 ± 0.243	(3.55–4.11)
T6	5	3.50 ± 0.396	(3.11–3.94)
T7	5	2.80 ± 0.262	(2.50–3.10)
MT1	5	25.26 ± 1.212	(23.60–26.60)
MT2	5	3.81 ± 0.163	(3.65–4.01)
MT3	5	3.92 ± 0.276	(3.62–4.31)
MT4	5	4.22 ± 0.493	(3.70–4.91)
MT5	5	2.96 ± 0.277	(2.73–3.33)
MT6	5	2.59 ± 0.354	(2.30–3.03)
MT7	5	2.54 ± 0.216	(2.25–2.78)
S1	1	31.80	
Tetracerus quadricornis			
H1	2	11.38 ± 0.403	(11.10–11.67)
H2	2	12.65 ± 0.318	(12.43–12.88)
H3	2	2.17 ± 0.184	(2.04–2.30)
H4	2	2.11 ± 0.035	(2.09–2.14)
H5	2	2.45 ± 0.127	(2.36–2.54)
H6	2	0.94 ± 0.071	(0.89–0.99)
H7	2	1.26 ± 0.049	(1.23–1.30)
H8	2	1.48 ± 0.085	(1.42–1.54)

U1	2	16.40 ± 0.820	(15.82–16.98)
U2	2	3.25 ± 0.106	(3.18–3.33)
R1	2	13.16 ± 0.863	(12.55–13.77)
R2	2	2.11 ± 0.056	(2.07–2.15)
R3	2	1.20 ± 0.028	(1.18–1.22)
R4	2	2.29 ± 0.042	(2.26–2.32)
R5	2	2.11 ± 0.035	(2.09–2.14)
R6	2	1.44 ± 0.085	(1.38–1.50)
R7	2	0.93 ± 0.085	(0.87–0.99)
MC1	2	13.30 ± 0.933	(12.64–13.96)
MC2	2	1.79 ± 0.056	(1.75–1.83)
MC3	2	1.12 ± 0.035	(1.10–1.15)
MC4	2	1.69 ± 0.099	(1.62–1.76)
MC5	2	1.26 ± 0.056	(1.22–1.30)
MC6	2	1.17 ± 0.042	(1.14–1.20)
MC7	2	0.97 ± 0.021	(0.96–0.99)
F1	2	16.57 ± 0.445	(16.26–16.89)
F2	2	3.70 ± 0.184	(3.57–3.83)
F3	2	3.02 ± 0.071	(2.97–3.07)
F4	2	1.55 ± 0.000	(1.55–1.55)
F5	2	2.90 ± 0.021	(2.89–2.92)
F6	2	1.47 ± 0.106	(1.40–1.55)
F7	2	1.38 ± 0.064	(1.34–1.43)
T1	2	19.46 ± 0.785	(18.91–20.02)
T2	2	3.44 ± 0.134	(3.35–3.54)
T3	2	2.25 ± 0.141	(2.15–2.35)
T4	2	2.27 ± 0.007	(2.27–2.28)
T5	2	1.78 ± 0.106	(1.71–1.86)
T6	2	1.51 ± 0.021	(1.50–1.53)
T7	2	1.34 ± 0.064	(1.30–1.39)
MT1	2	14.19 ± 0.785	(13.64–14.75)
MT2	2	1.76 ± 0.148	(1.66–1.87)
MT3	2	1.64 ± 0.007	(1.64–1.65)
MT4	2	1.77 ± 0.071	(1.72–1.82)
MT5	2	1.25 ± 0.064	(1.21–1.30)
MT6	2	1.14 ± 0.035	(1.12–1.17)
MT7	2	1.13 ± 0.049	(1.10–1.17)
S1	2	12.69 ± 0.445	(12.38–13.01)
Bubalis bubalis			
H1	4	29.45 ± 5.828	(23.20–34.90)
H2	4	34.15 ± 7.321	(26.90–40.80)
H3	4	7.96 ± 1.568	(5.79–9.18)
H4	4	8.30 ± 1.618	(6.23–9.75)
H5	4	8.84 ± 1.869	(6.50–10.58)
H6	4	3.22 ± 0.791	(2.32–3.90)
H7	4	4.58 ± 1.333	(3.09–5.89)
H8	4	5.98 ± 1.315	(4.44–7.28)
U1	4	40.80 ± 8.069	(32.00–47.80)
U2	4	12.22 ± 3.198	(8.40–15.40)
R1	4	30.52 ± 5.875	(24.40–35.80)
R2	4	8.43 ± 1.605	(6.38–9.83)
R3	4	4.43 ± 0.865	(3.35–5.16)
R4	4	9.25 ± 1.925	(6.96–11.04)
R5	4	8.31 ± 1.676	(6.34–9.89)

APPENDIX 2—(*Continued*)

R6	4	4.81 ± 1.480	(3.23–6.33)
R7	4	3.39 ± 1.033	(2.22–4.27)
MC1	4	19.05 ± 3.621	(15.30–22.30)
MC2	4	6.61 ± 1.146	(5.29–7.74)
MC3	4	3.78 ± 0.828	(2.70–4.50)
MC4	4	7.31 ± 1.602	(5.45–8.99)
MC5	4	3.34 ± 0.764	(2.50–4.11)
MC6	4	4.41 ± 1.318	(2.80–5.80)
MC7	4	2.71 ± 0.756	(1.92–3.56)
F1	4	40.55 ± 8.366	(31.60–49.00)
F2	4	14.67 ± 3.047	(11.36–17.82)
F3	4	10.23 ± 1.770	(8.16–11.91)
F4	4	4.59 ± 0.819	(3.49–5.23)
F5	4	10.02 ± 1.955	(7.31–11.63)
F6	4	4.58 ± 1.276	(3.23–5.91)
F7	4	4.74 ± 1.233	(3.27–5.80)
T1	4	36.40 ± 7.411	(28.10–42.90)
T2	4	11.50 ± 2.270	(8.56–13.38)
T3	4	6.64 ± 1.443	(4.95–8.22)
T4	4	7.78 ± 1.884	(5.37–9.45)
T5	4	5.03 ± 0.930	(3.85–5.91)
T6	4	4.96 ± 1.461	(3.32–6.47)
T7	4	4.12 ± 1.149	(2.71–5.07)
MT1	4	22.02 ± 4.076	(18.40–25.80)
MT2	4	5.52 ± 1.135	(4.17–6.68)
MT3	4	5.08 ± 1.076	(3.79–6.15)
MT4	4	6.86 ± 1.550	(4.99–8.15)
MT5	4	3.51 ± 0.707	(2.79–4.27)
MT6	4	3.77 ± 1.185	(2.35–4.82)
MT7	4	3.29 ± 0.889	(2.36–4.21)
S1	3	39.40 ± 9.300	(30.10–48.70)

Anoa mindorensis

H1	2	22.40 ± 0.000	(22.40–22.40)
H2	2	25.50 ± 0.707	(25.00–26.00)
H3	2	5.62 ± 0.544	(5.24–6.01)
H4	2	5.63 ± 0.014	(5.62–5.64)
H5	2	6.29 ± 0.000	(6.29–6.29)
H6	2	2.57 ± 0.021	(2.56–2.59)
H7	2	3.35 ± 0.014	(3.34–3.36)
H8	2	4.26 ± 0.000	(4.26–4.26)
U1	2	30.55 ± 1.484	(29.50–31.60)
U2	2	8.88 ± 0.367	(8.62–9.14)
R1	2	21.70 ± 0.424	(21.40–22.00)
R2	2	5.74 ± 0.035	(5.72–5.77)
R3	2	3.20 ± 0.063	(3.16–3.25)
R4	2	6.35 ± 0.190	(6.22–6.49)
R5	2	5.67 ± 0.035	(5.65–5.70)
R6	2	3.56 ± 0.134	(3.47–3.66)
R7	2	2.19 ± 0.056	(2.15–2.23)
MC1	2	12.63 ± 0.523	(12.26–13.00)
MC2	2	4.58 ± 0.212	(4.43–4.73)
MC3	2	2.73 ± 0.098	(2.66–2.80)
MC4	2	5.28 ± 0.318	(5.06–5.51)
MC5	2	2.72 ± 0.487	(2.38–3.07)
MC6	2	3.61 ± 0.162	(3.50–3.73)
MC7	2	2.11 ± 0.148	(2.01–2.22)
F1	2	28.80 ± 0.282	(28.60–29.00)
F2	2	8.82 ± 0.120	(8.74–8.91)
F3	2	6.27 ± 0.205	(6.13–6.42)
F4	2	3.24 ± 0.282	(3.04–3.44)
F5	2	6.51 ± 0.190	(6.38–6.65)
F6	2	3.14 ± 0.077	(3.09–3.20)
F7	2	3.09 ± 0.091	(3.03–3.16)
T1	2	26.95 ± 0.919	(26.30–27.60)
T2	2	7.97 ± 0.084	(7.91–8.03)
T3	2	4.05 ± 0.091	(3.99–4.12)
T4	2	5.30 ± 0.077	(5.25–5.36)
T5	2	3.63 ± 0.028	(3.61–3.65)
T6	2	3.59 ± 0.098	(3.52–3.66)
T7	2	2.98 ± 0.035	(2.96–3.01)
MT1	2	14.75 ± 0.494	(14.40–15.10)
MT2	2	3.89 ± 0.190	(3.76–4.03)
MT3	2	3.37 ± 0.042	(3.34–3.40)
MT4	2	4.78 ± 0.219	(4.63–4.94)
MT5	2	2.33 ± 0.332	(2.10–2.57)
MT6	2	2.95 ± 0.155	(2.84–3.06)
MT7	2	2.28 ± 0.070	(2.23–2.33)
S1	2	27.90 ± 1.697	(26.70–29.10)

Anoa depressicornis

H1	2	17.10 ± 0.707	(16.60–17.60)
H2	2	19.75 ± 1.484	(18.70–20.80)
H3	2	3.56 ± 0.869	(2.95–4.18)
H4	2	3.88 ± 0.480	(3.54–4.22)
H5	2	4.29 ± 0.700	(3.80–4.79)
H6	2	1.65 ± 0.021	(1.64–1.67)
H7	2	2.22 ± 0.459	(1.90–2.55)
H8	2	2.86 ± 0.403	(2.58–3.15)
U1	2	23.35 ± 1.626	(22.20–24.50)
U2	2	6.37 ± 0.657	(5.91–6.84)
R1	2	16.90 ± 1.131	(16.10–17.70)
R2	2	3.86 ± 0.473	(3.53–4.20)
R3	2	2.17 ± 0.332	(1.94–2.41)
R4	2	4.38 ± 0.707	(3.88–4.88)
R5	2	3.60 ± 0.615	(3.17–4.04)
R6	2	2.36 ± 0.388	(2.09–2.64)
R7	2	1.65 ± 0.183	(1.52–1.78)
MC1	2	10.50 ± 1.272	(9.60–11.40)
MC2	2	3.11 ± 0.431	(2.81–3.42)
MC3	2	1.75 ± 0.240	(1.58–1.92)
MC4	2	3.20 ± 0.530	(2.83–3.58)
MC5	2	1.58 ± 0.176	(1.46–1.71)
MC6	2	2.00 ± 0.275	(1.81–2.20)
MC7	2	1.41 ± 0.197	(1.27–1.55)
F1	2	22.10 ± 0.989	(21.40–22.80)
F2	2	6.43 ± 0.770	(5.89–6.98)
F3	2	4.66 ± 0.438	(4.35–4.97)
F4	2	1.93 ± 0.219	(1.78–2.09)
F5	2	4.48 ± 0.353	(4.23–4.73)

APPENDIX 2—(*Continued*)

F6	2	2.18 ± 0.424	(1.88–2.48)
F7	2	2.14 ± 0.438	(1.83–2.45)
T1	2	21.95 ± 1.202	(21.10–22.80)
T2	2	5.36 ± 0.678	(4.88–5.84)
T3	2	2.85 ± 0.586	(2.44–3.27)
T4	2	3.48 ± 0.487	(3.14–3.83)
T5	2	2.40 ± 0.403	(2.12–2.69)
T6	2	2.24 ± 0.318	(2.02–2.47)
T7	2	1.88 ± 0.233	(1.72–2.05)
MT1	2	12.05 ± 1.202	(11.20–12.90)
MT2	2	2.68 ± 0.367	(2.42–2.94)
MT3	2	2.34 ± 0.395	(2.06–2.62)
MT4	2	2.94 ± 0.480	(2.60–3.28)
MT5	2	1.64 ± 0.141	(1.54–1.74)
MT6	2	1.74 ± 0.240	(1.57–1.91)
MT7	2	1.59 ± 0.212	(1.44–1.74)
S1	2	20.80 ± 3.394	(18.40–23.20)
Bos gaurus			
H1	9	31.75 ± 1.525	(29.00–34.00)
H2	9	36.70 ± 1.928	(33.10–38.90)
H3	9	8.72 ± 0.727	(7.73–9.62)
H4	9	8.95 ± 0.572	(7.97–9.87)
H5	9	9.41 ± 0.712	(8.22–10.15)
H6	9	3.37 ± 0.236	(3.06–3.72)
H7	9	5.62 ± 0.605	(4.52–6.22)
H8	9	6.13 ± 0.544	(5.32–6.93)
U1	9	43.11 ± 2.611	(38.90–46.90)
U2	9	13.32 ± 1.261	(11.38–15.13)
R1	9	31.38 ± 1.772	(28.30–33.50)
R2	9	8.96 ± 0.564	(7.95–9.61)
R3	9	4.68 ± 0.395	(3.90–5.02)
R4	9	10.09 ± 0.757	8.68–10.77)
R5	9	9.40 ± 1.017	(7.67–11.01)
R6	9	5.93 ± 0.592	(4.96–6.65)
R7	9	3.27 ± 0.333	(2.59–3.63)
MC1	9	22.81 ± 1.315	(19.80–24.10)
MC2	9	6.78 ± 0.594	(5.91–7.66)
MC3	9	3.90 ± 0.316	(3.39–4.47)
MC4	9	6.65 ± 0.561	(5.70–7.26)
MC5	9	3.52 ± 0.267	(3.04–3.92)
MC6	9	4.47 ± 0.529	(3.46–5.10)
MC7	9	3.12 ± 0.283	(2.65–3.36)
F1	9	42.54 ± 2.376	(38.60–46.00)
F2	9	15.36 ± 1.576	(12.33–17.08)
F3	9	10.20 ± 1.017	(8.50–11.87)
F4	9	4.98 ± 0.278	(4.56–5.43)
F5	9	10.38 ± 0.627	(9.33–11.49)
F6	9	4.77 ± 0.389	(4.01–5.19)
F7	9	5.35 ± 0.404	(4.66–5.79)
T1	9	39.41 ± 2.235	(35.80–42.50)
T2	9	11.97 ± 0.679	(10.98–13.24)
T3	9	7.09 ± 0.738	(5.53–7.82)
T4	9	7.78 ± 0.495	(6.74–8.24)
T5	9	5.33 ± 0.329	(4.95–5.99)
T6	9	5.45 ± 0.533	(4.32–5.89)
T7	9	4.31 ± 0.419	(3.63–4.87)
MT1	9	25.34 ± 1.468	(22.40–26.80)
MT2	9	5.31 ± 0.420	(4.55–6.05)
MT3	9	5.20 ± 0.334	(4.58–5.54)
MT4	9	6.32 ± 0.589	(5.42–7.33)
MT5	9	3.57 ± 0.314	(3.04–4.09)
MT6	9	3.81 ± 0.355	(3.08–4.22)
MT7	9	3.69 ± 0.297	(3.05–4.05)
S1	6	49.93 ± 4.096	(42.60–53.30)
Bos banteng			
H1	3	28.13 ± 3.150	(25.00–31.30)
H2	3	32.43 ± 3.755	(28.80–36.30)
H3	3	7.46 ± 0.752	(6.68–8.18)
H4	3	7.78 ± 0.868	(6.87–8.60)
H5	3	8.17 ± 0.990	(7.16–9.14)
H6	3	2.86 ± 0.170	(2.70–3.04)
H7	3	4.44 ± 0.691	(3.73–5.11)
H8	3	5.33 ± 0.690	(4.64–6.02)
U1	3	38.20 ± 3.803	(34.50–42.10)
U2	3	11.17 ± 1.611	(9.41–12.57)
R1	3	27.80 ± 2.424	(25.60–30.40)
R2	3	7.70 ± 0.802	(6.86–8.46)
R3	3	3.90 ± 0.533	(3.41–4.47)
R4	3	8.61 ± 1.067	(7.63–9.75)
R5	3	7.52 ± 1.230	(6.29–8.75)
R6	3	4.60 ± 0.830	(3.79–5.45)
R7	3	2.53 ± 0.342	(2.27–2.92)
MC1	3	21.56 ± 1.250	(20.70–23.00)
MC2	3	5.78 ± 0.708	(5.15–6.55)
MC3	3	3.32 ± 0.360	(3.00–3.71)
MC4	3	5.56 ± 0.715	(4.95–6.35)
MC5	3	2.88 ± 0.419	(2.50–3.33)
MC6	3	3.78 ± 0.495	(3.29–4.28)
MC7	3	2.65 ± 0.410	(2.24–3.06)
F1	3	37.53 ± 3.253	(34.20–40.70)
F2	3	12.87 ± 1.022	(11.76–13.77)
F3	3	8.97 ± 1.030	(7.95–10.01)
F4	3	4.44 ± 0.721	(3.89–5.26)
F5	3	8.94 ± 0.898	(7.96–9.72)
F6	3	4.12 ± 0.613	(3.58–4.79)
F7	3	4.57 ± 0.585	(4.00–5.17)
T1	3	36.03 ± 3.655	(32.50–39.80)
T2	3	10.12 ± 0.768	(9.29–10.80)
T3	3	5.75 ± 0.801	(5.10–6.65)
T4	3	6.67 ± 0.698	(5.94–7.33)
T5	3	4.71 ± 0.184	(4.56–4.92)
T6	3	4.63 ± 0.876	(3.91–5.61)
T7	3	3.53 ± 0.852	(2.90–4.50)
MT1	3	23.96 ± 1.250	(23.10–25.40)
MT2	3	4.65 ± 0.552	(4.05–5.13)
MT3	3	4.47 ± 0.489	(4.03–5.00)
MT4	3	5.22 ± 0.666	(4.62–5.94)
MT5	3	2.93 ± 0.305	(2.63–3.24)
MT6	3	3.40 ± 0.337	(3.09–3.76)

APPENDIX 2—(*Continued*)

MT7	3	3.14 ± 0.415	(2.72–3.55)
S1	3	39.40 ± 5.381	(33.40–43.80)

Bos sauveli

H1	4	25.95 ± 2.154	(23.90–28.40)
H2	4	29.95 ± 2.137	(28.00–31.80)
H3	4	6.75 ± 0.668	(5.90–7.38)
H4	4	7.25 ± 0.654	(6.68–7.89)
H5	4	7.76 ± 0.408	(7.35–8.15)
H6	4	2.51 ± 0.352	(2.16–2.93)
H7	4	3.95 ± 0.646	(3.37–4.78)
H8	4	4.70 ± 0.496	(4.17–5.14)
U1	4	36.75 ± 2.757	(33.80–39.10)
U2	4	9.70 ± 1.240	(8.22–10.89)
R1	4	27.67 ± 1.967	(25.30–29.70)
R2	4	7.80 ± 1.445	(6.76–9.84)
R3	4	3.71 ± 0.334	(3.37–4.08)
R4	4	8.27 ± 0.778	(7.42–8.98)
R5	4	7.45 ± 0.783	(6.66–8.15)
R6	4	4.35 ± 0.513	(3.95–5.09)
R7	4	2.67 ± 0.346	(2.26–3.07)
MC1	4	22.10 ± 1.042	(21.10–23.00)
MC2	4	5.63 ± 0.536	(5.12–6.19)
MC3	4	3.29 ± 0.259	(3.03–3.53)
MC4	4	5.67 ± 0.649	(4.90–6.29)
MC5	4	2.93 ± 0.276	(2.67–3.20)
MC6	4	3.40 ± 0.519	(2.88–3.93)
MC7	4	2.49 ± 0.266	(2.23–2.76)
F1	4	34.42 ± 2.263	(31.80–36.60)
F2	4	11.32 ± 1.353	(10.15–12.90)
F3	4	7.86 ± 0.753	(7.19–8.59)
F4	4	4.07 ± 0.303	(3.67–4.38)
F5	4	8.34 ± 0.400	(8.03–8.87)
F6	4	3.93 ± 0.451	(3.54–4.40)
F7	4	4.47 ± 0.570	(3.96–5.24)
T1	4	33.02 ± 2.428	(30.20–35.10)
T2	4	10.00 ± 0.922	(9.00–10.89)
T3	4	5.63 ± 0.363	(5.19–6.07)
T4	4	6.38 ± 0.428	(5.96–6.80)
T5	4	5.09 ± 1.209	(4.22–6.81)
T6	4	4.53 ± 0.506	(3.94–5.10)
T7	4	3.39 ± 0.279	(3.06–3.67)
MT1	4	24.52 ± 1.034	(23.40–25.50)
MT2	4	4.52 ± 0.481	(4.11–5.03)
MT3	4	4.34 ± 0.213	(4.08–4.53)
MT4	4	5.26 ± 0.544	(4.63–5.72)
MT5	4	2.99 ± 0.212	(2.77–3.21)
MT6	4	3.00 ± 0.437	(2.61–3.42)
MT7	4	3.07 ± 0.229	(2.82–3.34)
S1	4	36.30 ± 3.565	(32.50–40.40)

Bos grunniens

H1	2	24.70 ± 1.272	(23.80–25.60)
H2	2	28.10 ± 1.555	(27.00–29.20)
H3	2	6.56 ± 0.586	(6.15–6.98)
H4	2	6.68 ± 0.120	(6.60–6.77)
H5	2	6.99 ± 0.395	(6.71–7.27)
H6	2	2.77 ± 0.346	(2.53–3.02)
H7	2	3.37 ± 0.304	(3.16–3.59)
H8	2	3.95 ± 0.155	(3.84–4.06)
U1	2	33.95 ± 1.343	(33.00–34.90)
U2	2	8.95 ± 1.074	(8.19–9.71)
R1	2	24.75 ± 1.484	(23.70–25.80)
R2	2	6.67 ± 0.183	(6.54–6.80)
R3	2	3.49 ± 0.219	(3.34–3.65)
R4	2	7.07 ± 0.296	(6.86–7.28)
R5	2	6.48 ± 0.466	(6.15–6.81)
R6	2	3.63 ± 0.077	(3.58–3.69)
R7	2	2.31 ± 0.091	(2.25–2.38)
MC1	2	13.80 ± 0.707	(13.30–14.30)
MC2	2	5.13 ± 0.205	(4.99–5.28)
MC3	2	2.77 ± 0.148	(2.67–2.88)
MC4	2	5.18 ± 0.007	(5.18–5.19)
MC5	2	2.51 ± 0.056	(2.47–2.55)
MC6	2	3.13 ± 0.296	(2.92–3.34)
MC7	2	2.03 ± 0.077	(1.98–2.09)
F1	2	32.75 ± 1.202	(31.90–33.60)
F2	2	10.56 ± 0.883	(9.94–11.19)
F3	2	7.69 ± 0.714	(7.19–8.20)
F4	2	3.45 ± 0.374	(3.19–3.72)
F5	2	7.73 ± 0.452	(7.41–8.05)
F6	2	3.12 ± 0.106	(3.05–3.20)
F7	2	3.58 ± 0.063	(3.54–3.63)
T1	2	31.35 ± 1.767	(30.10–32.60)
T2	2	8.87 ± 0.502	(8.52–9.23)
T3	2	5.51 ± 0.339	(5.27–5.75)
T4	2	5.65 ± 0.226	(5.49–5.81)
T5	2	3.76 ± 0.063	(3.72–3.81)
T6	2	3.56 ± 0.063	(3.52–3.61)
T7	2	2.72 ± 0.141	(2.62–2.82)
MT1	2	17.75 ± 0.070	(17.70–17.80)
MT2	2	4.03 ± 0.176	(3.91–4.16)
MT3	2	4.00 ± 0.021	(3.99–4.02)
MT4	2	4.66 ± 0.212	(4.51–4.81)
MT5	2	2.74 ± 0.106	(2.67–2.82)
MT6	2	2.50 ± 0.289	(2.30–2.71)
MT7	2	2.49 ± 0.169	(2.37–2.61)
S1	1	35.10	

Syncerus caffer

H1	6	29.55 ± 0.960	(28.10–30.80)
H2	6	35.10 ± 1.531	(33.00–37.20)
H3	6	8.18 ± 0.545	(7.63–9.07)
H4	6	8.99 ± 0.399	(8.41–9.42)
H5	6	9.65 ± 0.691	(8.80–10.72)
H6	6	3.32 ± 0.424	(2.81–3.86)
H7	6	5.20 ± 0.349	(4.63–5.70)
H8	6	6.07 ± 0.442	(5.49–6.50)
U1	6	41.08 ± 0.483	(40.60–41.90)
U2	6	12.37 ± 0.800	(11.38–13.32)
R1	6	30.30 ± 0.715	(29.20–31.30)

APPENDIX 2—(*Continued*)

R2	6	8.99 ± 0.440	(8.38–9.51)
R3	6	4.92 ± 0.304	(4.52–5.25)
R4	6	10.23 ± 0.622	(9.37–11.06)
R5	6	9.40 ± 0.563	(8.58–10.04)
R6	6	5.42 ± 0.462	(4.81–5.77)
R7	6	3.58 ± 0.296	(3.16–3.90)
MC1	6	18.30 ± 0.912	(17.60–20.10)
MC2	6	7.11 ± 0.312	(6.70–7.48)
MC3	6	4.01 ± 0.184	(3.67–4.20)
MC4	6	7.82 ± 0.470	(7.12–8.33)
MC5	6	3.36 ± 0.253	(3.13–3.82)
MC6	6	5.01 ± 0.448	(4.33–5.50)
MC7	6	3.04 ± 0.294	(2.62–3.30)
F1	6	38.88 ± 1.188	(37.60–40.80)
F2	6	14.69 ± 1.352	(13.10–16.81)
F3	6	9.62 ± 0.643	(8.78–10.69)
F4	6	5.13 ± 0.429	(4.58–5.72)
F5	6	10.19 ± 0.445	(9.52–10.68)
F6	6	5.01 ± 0.343	(4.41–5.38)
F7	6	4.80 ± 0.290	(4.37–5.16)
T1	6	37.73 ± 1.526	(35.50–39.10)
T2	6	11.83 ± 0.533	(10.80–12.19)
T3	6	6.67 ± 0.669	(5.75–7.73)
T4	6	7.92 ± 0.335	(7.55–8.44)
T5	6	5.07 ± 0.159	(4.86–5.26)
T6	6	5.03 ± 0.276	(4.61–5.30)
T7	6	4.38 ± 0.375	(3.87–4.83)
MT1	6	20.75 ± 0.926	(19.60–22.10)
MT2	6	5.79 ± 0.315	(5.41–6.18)
MT3	6	5.34 ± 0.227	(5.02–5.60)
MT4	6	7.07 ± 0.401	(6.42–7.46)
MT5	6	3.55 ± 0.228	(3.28–3.90)
MT6	6	4.07 ± 0.227	(3.79–4.41)
MT7	6	3.40 ± 0.250	(2.97–3.64)
S1	4	45.02 ± 1.030	(43.90–46.40)
Bison bison			
H1	5	31.18 ± 2.252	(27.60–33.40)
H2	5	35.24 ± 2.780	(31.00–38.30)
H3	5	7.81 ± 0.624	(7.01–8.72)
H4	5	8.76 ± 0.651	(7.73–9.52)
H5	5	8.85 ± 0.725	(7.70–9.71)
H6	5	2.89 ± 0.400	(2.37–3.45)
H7	5	4.80 ± 0.550	(3.88–5.29)
H8	5	5.91 ± 0.627	(4.87–6.50)
U1	5	41.66 ± 3.269	(36.30–44.10)
U2	5	12.88 ± 1.526	(10.43–14.20)
R1	5	30.60 ± 1.742	(27.90–32.30)
R2	5	8.81 ± 0.657	(7.78–9.60)
R3	5	4.60 ± 0.357	(4.08–5.04)
R4	5	9.56 ± 0.751	(8.35–10.42)
R5	5	8.52 ± 0.696	(7.29–8.96)
R6	5	4.93 ± 0.568	(4.12–5.71)
R7	5	3.20 ± 0.307	(2.68–3.45)
MC1	5	19.56 ± 0.705	(18.70–20.20)
MC2	5	6.81 ± 0.527	(5.94–7.37)

MC3	5	3.92 ± 0.332	(3.38–4.28)
MC4	5	7.00 ± 0.574	(61.8–7.79)
MC5	5	3.32 ± 0.297	(2.97–3.76)
MC6	5	4.31 ± 0.501	(3.49–4.82)
MC7	5	2.87 ± 0.242	(2.46–3.08)
F1	5	39.28 ± 2.612	(35.20–41.50)
F2	5	13.59 ± 1.388	(11.46–15.00)
F3	5	9.95 ± 0.894	(8.49–10.67)
F4	5	4.55 ± 0.338	(4.24–5.08)
F5	5	9.59 ± 0.656	(8.74–10.54)
F6	5	4.31 ± 0.401	(3.62–4.61)
F7	5	4.62 ± 0.303	(4.21–5.02)
T1	5	37.12 ± 2.367	(33.40–38.90)
T2	5	11.52 ± 0.628	(10.57–12.29)
T3	5	6.52 ± 0.662	(5.52–7.27)
T4	5	7.10 ± 0.339	(6.87–7.70)
T5	5	5.10 ± 0.287	(4.67–5.42)
T6	5	5.09 ± 0.364	(4.55–5.52)
T7	5	4.05 ± 0.293	(3.62–4.42)
MT1	5	24.16 ± 0.817	(23.00–24.80)
MT2	5	5.09 ± 0.251	(4.77–5.44)
MT3	5	4.89 ± 0.345	(4.57–5.36)
MT4	5	6.21 ± 0.391	(5.62–6.71)
MT5	5	3.45 ± 0.226	(3.14–3.78)
MT6	5	3.43 ± 0.337	(2.90–3.68)
MT7	5	3.38 ± 0.228	(3.01–3.61)
S1	5	48.08 ± 4.386	(40.50–51.20)
Cephalophus callipygus			
H1	2	11.40 ± 0.282	(11.20–11.60)
H2	2	12.45 ± 0.212	(12.30–12.60)
H3	2	2.26 ± 0.162	(2.15–2.38)
H4	2	2.16 ± 0.084	(2.10–2.22)
H5	2	2.46 ± 0.084	(2.40–2.52)
H6	2	0.93 ± 0.127	(0.84–1.02)
H7	2	1.34 ± 0.098	(1.27–1.41)
H8	2	1.47 ± 0.134	(1.38–1.57)
U1	2	14.90 ± 0.141	(14.80–15.00)
U2	2	3.60 ± 0.197	(3.46–3.74)
R1	2	11.55 ± 0.070	(11.50–11.60)
R2	2	2.16 ± 0.106	(2.09–2.24)
R3	2	1.24 ± 0.007	(1.24–1.25)
R4	2	2.40 ± 0.162	(2.29–2.52)
R5	2	2.16 ± 0.176	(2.04–2.29)
R6	2	1.46 ± 0.197	(1.32–1.60)
R7	2	0.89 ± 0.056	(0.85–0.93)
MC1	2	10.25 ± 0.212	(10.10–10.40)
MC2	2	1.69 ± 0.176	(1.57–1.82)
MC3	2	1.18 ± 0.042	(1.15–1.21)
MC4	2	1.75 ± 0.141	(1.65–1.85)
MC5	2	1.11 ± 0.162	(1.00–1.23)
MC6	2	1.07 ± 0.063	(1.03–1.12)
MC7	2	0.90 ± 0.077	(0.85–0.96)
F1	2	16.05 ± 0.636	(15.60–16.50)
F2	2	3.69 ± 0.586	(3.28–4.11)
F3	2	2.96 ± 0.296	(2.75–3.17)

APPENDIX 2—(*Continued*)

F4	2	1.65 ± 0.098	(1.58–1.72)
F5	2	2.94 ± 0.289	(2.74–3.15)
F6	2	1.54 ± 0.148	(1.44–1.65)
F7	2	1.65 ± 0.176	(1.53–1.78)
T1	2	16.60 ± 0.282	(16.40–16.80)
T2	2	3.48 ± 0.289	(3.28–3.69)
T3	2	2.28 ± 0.205	(2.14–2.43)
T4	2	2.19 ± 0.070	(2.14–2.24)
T5	2	1.72 ± 0.127	(1.63–1.81)
T6	2	1.55 ± 0.148	(1.45–1.66)
T7	2	1.30 ± 0.042	(1.27–1.33)
MT1	2	12.00 ± 0.282	(11.80–12.20)
MT2	2	1.50 ± 0.014	(1.49–1.51)
MT3	2	1.62 ± 0.148	(1.52–1.73)
MT4	2	1.74 ± 0.169	(1.62–1.86)
MT5	2	1.14 ± 0.106	(1.07–1.22)
MT6	2	1.18 ± 0.134	(1.09–1.28)
MT7	2	1.08 ± 0.134	(0.99–1.18)
S1	2	12.18 ± 0.516	(11.82–12.55)

Cephalophus dorsalis

H1	11	11.65 ± 0.461	(10.90–12.20)
H2	11	12.93 ± 0.571	(12.00–13.60)
H3	11	2.34 ± 0.156	(2.12–2.56)
H4	11	2.12 ± 0.127	(1.88–2.26)
H5	11	2.37 ± 0.155	(2.12–2.60)
H6	11	0.93 ± 0.071	(0.82–1.04)
H7	11	1.23 ± 0.081	(1.09–1.33)
H8	11	1.39 ± 0.105	(1.19–1.50)
U1	11	14.52 ± 0.598	(13.30–15.40)
U2	11	3.40 ± 0.160	(3.19–3.64)
R1	11	11.19 ± 0.432	(10.30–11.80)
R2	11	2.08 ± 0.125	(1.83–2.19)
R3	11	1.13 ± 0.075	(0.98–1.22)
R4	11	2.27 ± 0.157	(1.97–2.47)
R5	11	2.06 ± 0.139	(1.81–2.27)
R6	11	1.44 ± 0.116	(1.24–1.55)
R7	11	0.82 ± 0.070	(0.68–0.94)
MC1	11	9.32 ± 0.628	(8.38–10.20)
MC2	11	1.74 ± 0.095	(1.57–1.88)
MC3	11	1.09 ± 0.066	(0.98–1.23)
MC4	11	1.68 ± 0.106	(1.52–1.82)
MC5	11	0.97 ± 0.065	(0.85–1.07)
MC6	11	1.14 ± 0.113	(0.94–1.29)
MC7	11	0.87 ± 0.068	(0.70–0.95)
F1	11	16.21 ± 0.753	(14.80–17.10)
F2	11	3.75 ± 0.187	(3.42–4.09)
F3	11	3.16 ± 0.213	(2.84–3.50)
F4	11	1.45 ± 0.073	(1.30–1.57)
F5	11	2.88 ± 0.145	(2.62–3.14)
F6	11	1.45 ± 0.094	(1.26–1.55)
F7	11	1.55 ± 0.110	(1.30–1.68)
T1	11	15.92 ± 0.624	(14.60–16.60)
T2	11	3.47 ± 0.171	(3.13–3.78)
T3	11	2.02 ± 0.158	(1.81–2.30)
T4	11	2.19 ± 0.155	(1.86–2.42)
T5	11	1.70 ± 0.082	(1.55–1.84)
T6	11	1.48 ± 0.108	(1.27–1.60)
T7	11	1.21 ± 0.065	(1.08–1.28)
MT1	11	10.94 ± 0.848	(9.31–12.00)
MT2	11	1.68 ± 0.093	(1.50–1.82)
MT3	11	1.57 ± 0.075	(1.44–1.69)
MT4	11	1.72 ± 0.122	(1.48–1.90)
MT5	11	1.10 ± 0.062	(1.01–1.20)
MT6	11	1.14 ± 0.105	(0.92–1.25)
MT7	11	1.07 ± 0.080	(0.90–1.19)
S1	8	12.25 ± 0.500	(11.59–12.94)

Cephalophus leucogaster

H1	7	11.11 ± 0.333	(10.60–11.50)
H2	7	12.27 ± 0.228	(11.90–12.60)
H3	7	2.16 ± 0.064	(2.08–2.26)
H4	7	1.98 ± 0.063	(1.92–2.07)
H5	7	2.24 ± 0.039	(2.20–2.32)
H6	7	0.84 ± 0.067	(0.75–0.95)
H7	7	1.17 ± 0.045	(1.12–1.24)
H8	7	1.38 ± 0.076	(1.24–1.47)
U1	7	14.45 ± 0.568	(13.50–15.00)
U2	7	3.20 ± 0.161	(2.96–3.39)
R1	7	11.20 ± 0.412	(10.40–11.70)
R2	7	1.97 ± 0.082	(1.89–2.09)
R3	7	1.14 ± 0.041	(1.08–1.20)
R4	7	2.14 ± 0.051	(2.07–2.21)
R5	7	1.93 ± 0.053	(1.87–2.01)
R6	7	1.41 ± 0.053	(1.35–1.51)
R7	7	0.83 ± 0.055	(0.76–0.94)
MC1	7	10.08 ± 0.467	(9.48–10.60)
MC2	7	1.61 ± 0.072	(1.50–1.71)
MC3	7	1.07 ± 0.035	(1.01–1.11)
MC4	7	1.58 ± 0.022	(1.55–1.61)
MC5	7	1.02 ± 0.030	(0.98–1.07)
MC6	7	1.05 ± 0.030	(1.00–1.09)
MC7	7	0.83 ± 0.030	(0.79–0.87)
F1	7	15.51 ± 0.380	(15.10–16.00)
F2	7	3.63 ± 0.125	(3.48–3.84)
F3	7	2.86 ± 0.139	(2.66–3.12)
F4	7	1.43 ± 0.029	(1.40–1.49)
F5	7	2.81 ± 0.075	(2.72–2.93)
F6	7	1.38 ± 0.056	(1.27–1.45)
F7	7	1.57 ± 0.074	(1.48–1.66)
T1	7	16.27 ± 0.446	(15.50–16.80)
T2	7	3.35 ± 0.121	(3.20–3.55)
T3	7	2.13 ± 0.117	(1.93–2.26)
T4	7	2.12 ± 0.047	(2.05–2.19)
T5	7	1.59 ± 0.037	(1.54–1.64)
T6	7	1.50 ± 0.084	(1.36–1.61)
T7	7	1.21 ± 0.037	(1.17–1.26)
MT1	7	12.22 ± 0.423	(11.68–12.80)
MT2	7	1.59 ± 0.039	(1.53–1.64)
MT3	7	1.58 ± 0.054	(1.52–1.69)
MT4	7	1.69 ± 0.047	(1.65–1.78)
MT5	7	1.11 ± 0.042	(1.07–1.18)

APPENDIX 2—(*Continued*)

MT6	7	1.08 ± 0.034	(1.02–1.12)
MT7	7	1.09 ± 0.050	(1.02–1.15)
S1	5	11.63 ± 0.270	(11.20–11.91)

Cephalophus natalensis

H1	4	11.17 ± 0.287	(10.80–11.50)
H2	4	12.40 ± 0.216	(12.20–12.70)
H3	4	2.44 ± 0.203	(2.25–2.66)
H4	4	2.15 ± 0.160	(1.96–2.31)
H5	4	2.37 ± 0.103	(2.24–2.49)
H6	4	0.91 ± 0.049	(0.85–0.97)
H7	4	1.21 ± 0.089	(1.11–1.31)
H8	4	1.44 ± 0.053	(1.38–1.49)
U1	4	14.45 ± 0.465	(13.90–15.00)
U2	4	3.43 ± 0.170	(3.24–3.60)
R1	4	11.30 ± 0.244	(11.10–11.60)
R2	4	2.15 ± 0.126	(2.00–2.28)
R3	4	1.22 ± 0.078	(1.12–1.31)
R4	4	2.39 ± 0.175	(2.19–2.57)
R5	4	2.02 ± 0.148	(1.89–2.19)
R6	4	1.43 ± 0.104	(1.33–1.58)
R7	4	0.85 ± 0.083	(0.74–0.93)
MC1	4	9.80 ± 0.476	(9.10–10.10)
MC2	4	1.72 ± 0.096	(1.61–1.84)
MC3	4	1.15 ± 0.071	(1.06–1.23)
MC4	4	1.64 ± 0.069	(1.56–1.73)
MC5	4	1.01 ± 0.088	(0.91–1.11)
MC6	4	1.06 ± 0.056	(1.02–1.14)
MC7	4	0.83 ± 0.081	(0.72–0.91)
F1	4	15.47 ± 0.585	(14.60–15.80)
F2	4	3.80 ± 0.298	(3.40–4.09)
F3	4	2.89 ± 0.095	(2.80–3.01)
F4	4	1.57 ± 0.069	(1.48–1.65)
F5	4	2.91 ± 0.138	(2.73–3.03)
F6	4	1.34 ± 0.104	(1.19–1.43)
F7	4	1.57 ± 0.167	(1.36–1.75)
T1	4	16.27 ± 0.394	(15.80–16.60)
T2	4	3.49 ± 0.179	(3.32–3.65)
T3	4	2.28 ± 0.175	(2.06–2.48)
T4	4	2.19 ± 0.124	(2.06–2.33)
T5	4	1.70 ± 0.068	(1.62–1.77)
T6	4	1.45 ± 0.057	(1.39–1.53)
T7	4	1.25 ± 0.086	(1.14–1.33)
MT1	4	11.75 ± 0.591	(10.90–12.20)
MT2	4	1.65 ± 0.080	(1.54–1.72)
MT3	4	1.62 ± 0.092	(1.49–1.70)
MT4	4	1.71 ± 0.079	(1.62–1.80)
MT5	4	1.11 ± 0.063	(1.03–1.17)
MT6	4	1.10 ± 0.104	(1.00–1.25)
MT7	4	1.07 ± 0.088	(0.94–1.12)
S1	4	12.04 ± 0.346	(11.56–12.34)

Cephalophus niger

H1	1	15.30	MC7	1	1.10
H2	1	17.50	F1	1	20.60
H3	1	2.98	F2	1	4.90
H4	1	2.85	F3	1	3.79
H5	1	3.12	F4	1	1.84
H6	1	1.18	F5	1	3.95
H7	1	1.67	F6	1	1.75
H8	1	1.76	F7	1	1.89
U1	1	18.80	T1	1	20.70
U2	1	4.34	T2	1	4.56
R1	1	14.30	T3	1	2.80
R2	1	2.72	T4	1	2.82
R3	1	1.58	T5	1	2.20
R4	1	2.94	T6	1	1.82
R5	1	2.74	T7	1	1.83
R6	1	1.89	MT1	1	13.00
R7	1	1.07	MT2	1	2.16
MC1	1	11.70	MT3	1	2.16
MC2	1	2.24	MT4	1	2.25
MC3	1	1.37	MT5	1	1.43
MC4	1	2.20	MT6	1	1.39
MC5	1	1.29	MT7	1	1.32
MC6	1	1.47	S1	1	15.68

Cephalophus nigrifrons

H1	7	11.32 ± 0.415	(10.80–11.80)
H2	7	12.40 ± 0.404	(11.80–12.90)
H3	7	2.06 ± 0.086	(1.98–2.19)
H4	7	1.92 ± 0.053	(1.85–2.00)
H5	7	2.22 ± 0.064	(2.13–2.32)
H6	7	0.86 ± 0.080	(0.78–0.97)
H7	7	1.08 ± 0.026	(1.05–1.13)
H8	7	1.32 ± 0.061	(1.25–1.43)
U1	7	14.65 ± 0.562	(13.90–15.60)
U2	7	3.00 ± 0.059	(2.92–3.10)
R1	7	11.64 ± 0.519	(11.00–12.40)
R2	7	1.92 ± 0.058	(1.83–2.01)
R3	7	1.11 ± 0.057	(1.04–1.20)
R4	7	2.11 ± 0.060	(2.00–2.19)
R5	7	1.92 ± 0.033	(1.89–1.99)
R6	7	1.35 ± 0.059	(1.26–1.45)
R7	7	0.81 ± 0.052	(0.74–0.89)
MC1	7	10.77 ± 0.457	(10.20–11.60)
MC2	7	1.58 ± 0.052	(1.51–1.65)
MC3	7	1.06 ± 0.042	(1.00–1.11)
MC4	7	1.58 ± 0.063	(1.49–1.69)
MC5	7	0.96 ± 0.028	(0.91–0.99)
MC6	7	1.04 ± 0.045	(0.97–1.09)
MC7	7	0.81 ± 0.049	(0.77–0.91)
F1	7	15.27 ± 0.488	(14.80–16.00)
F2	7	3.59 ± 0.192	(3.32–3.81)
F3	7	2.84 ± 0.177	(2.62–3.17)
F4	7	1.33 ± 0.054	(1.24–1.41)
F5	7	2.71 ± 0.076	(2.60–2.85)
F6	7	1.27 ± 0.072	(1.18–1.39)
F7	7	1.39 ± 0.078	(1.31–1.54)
T1	7	17.31 ± 0.622	(16.80–18.30)
T2	7	3.33 ± 0.104	(3.22–3.47)

APPENDIX 2—(*Continued*)

T3	7	2.16 ± 0.135	(1.94–2.36)
T4	7	2.05 ± 0.050	(2.00–2.15)
T5	7	1.58 ± 0.063	(1.50–1.67)
T6	7	1.35 ± 0.052	(1.28–1.41)
T7	7	1.23 ± 0.058	(1.13–1.31)
MT1	7	12.87 ± 0.475	(12.20–13.60)
MT2	7	1.56 ± 0.045	(1.52–1.63)
MT3	7	1.50 ± 0.058	(1.41–1.58)
MT4	7	1.71 ± 0.061	(1.66–1.80)
MT5	7	1.07 ± 0.029	(1.02–1.11)
MT6	7	1.06 ± 0.032	(1.01–1.11)
MT7	7	1.02 ± 0.040	(0.97–1.09)
S1	4	11.32 ± 0.533	(10.69–11.94)

Cephalophus silvicultor

H1	5	17.16 ± 0.650	(16.50–18.00)
H2	5	19.30 ± 0.570	(18.80–20.10)
H3	5	3.91 ± 0.181	(3.63–4.11)
H4	5	3.50 ± 0.158	(3.28–3.71)
H5	5	3.90 ± 0.168	(3.81–4.20)
H6	5	1.39 ± 0.087	(1.24–1.47)
H7	5	2.02 ± 0.212	(1.81–2.31)
H8	5	2.37 ± 0.205	(2.14–2.61)
U1	5	22.36 ± 0.993	(21.20–23.40)
U2	5	5.58 ± 0.198	(5.38–5.80)
R1	5	16.72 ± 0.756	(15.70–17.50)
R2	5	3.42 ± 0.176	(3.22–3.66)
R3	5	1.88 ± 0.063	(1.80–1.96)
R4	5	3.72 ± 0.193	(3.47–3.98)
R5	5	3.37 ± 0.215	(3.11–3.65)
R6	5	2.41 ± 0.199	(2.19–2.63)
R7	5	1.32 ± 0.137	(1.20–1.54)
MC1	5	14.74 ± 0.726	(13.90–15.40)
MC2	5	2.73 ± 0.086	(2.60–2.84)
MC3	5	1.76 ± 0.056	(1.69–1.84)
MC4	5	2.87 ± 0.117	(2.72–3.04)
MC5	5	1.53 ± 0.047	(1.46–1.57)
MC6	5	1.81 ± 0.129	(1.60–1.93)
MC7	5	1.41 ± 0.039	(1.37–1.47)
F1	5	23.98 ± 1.287	(22.70–25.50)
F2	5	5.89 ± 0.520	(5.15–6.41)
F3	5	4.79 ± 0.374	(4.40–5.32)
F4	5	2.51 ± 0.170	(2.35–2.77)
F5	5	4.82 ± 0.336	(4.31–5.17)
F6	5	2.23 ± 0.164	(1.99–2.42)
F7	5	2.51 ± 0.243	(2.11–2.72)
T1	5	23.20 ± 0.989	(22.10–24.60)
T2	5	5.64 ± 0.314	(5.16–5.99)
T3	5	3.32 ± 0.164	(3.11–3.54)
T4	5	3.46 ± 0.211	(3.11–3.62)
T5	5	2.67 ± 0.101	(2.53–2.80)
T6	5	2.33 ± 0.134	(2.12–2.47)
T7	5	2.14 ± 0.118	(2.01–2.31)
MT1	5	15.96 ± 0.658	(15.20–16.60)
MT2	5	2.68 ± 0.096	(2.52–2.77)
MT3	5	2.42 ± 0.083	(2.30–2.52)
MT4	5	2.85 ± 0.157	(2.60–2.98)
MT5	5	1.65 ± 0.110	(1.52–1.78)
MT6	5	1.77 ± 0.140	(1.56–1.94)
MT7	5	1.67 ± 0.086	(1.59–1.78)
S1	4	19.57 ± 0.873	(18.80–20.60)

Cephalophus zebra

H1	1	9.38	MC7	1	0.70
H2	1	10.34	F1	1	13.60
H3	1	2.02	F2	1	3.14
H4	1	1.80	F3	1	2.49
H5	1	2.00	F4	1	1.37
H6	1	0.85	F5	1	2.60
H7	1	1.00	F6	1	1.20
H8	1	1.21	F7	1	1.43
U1	1	12.30	T1	1	13.20
U2	1	2.80	T2	1	3.04
R1	1	9.34	T3	1	1.84
R2	1	1.82	T4	1	1.90
R3	1	1.04	T5	1	1.47
R4	1	2.02	T6	1	1.21
R5	1	1.75	T7	1	1.06
R6	1	1.20	MT1	1	10.33
R7	1	0.65	MT2	1	1.46
MC1	1	8.41	MT3	1	1.42
MC2	1	1.51	MT4	1	1.48
MC3	1	0.93	MT5	1	0.89
MC4	1	1.39	MT6	1	0.93
MC5	1	0.81	MT7	1	0.88
MC6	1	0.88	S1	0	

Cephalophus monticola

H1	11	8.49 ± 0.251	(8.14–8.88)
H2	11	9.12 ± 0.256	(8.73–9.52)
H3	11	1.39 ± 0.075	(1.22–1.49)
H4	11	1.26 ± 0.039	(1.22–1.33)
H5	11	1.44 ± 0.043	(1.35–1.52)
H6	11	0.56 ± 0.040	(0.49–0.62)
H7	11	0.70 ± 0.047	(0.65–0.79)
H8	11	0.88 ± 0.056	(0.74–0.96)
U1	11	10.02 ± 0.417	(9.39–10.67)
U2	11	2.00 ± 0.059	(1.91–2.09)
R1	11	8.02 ± 0.355	(7.41–8.53)
R2	11	1.23 ± 0.033	(1.17–1.30)
R3	11	0.72 ± 0.031	(0.68–0.79)
R4	11	1.35 ± 0.051	(1.27–1.42)
R5	11	1.22 ± 0.053	(1.15–1.31)
R6	11	0.85 ± 0.047	(0.79–0.93)
R7	11	0.48 ± 0.044	(0.42–0.58)
MC1	11	7.27 ± 0.856	(6.35–8.93)
MC2	11	1.06 ± 0.048	(1.01–1.14)
MC3	11	0.75 ± 0.113	(0.65–1.03)
MC4	11	0.94 ± 0.046	(0.88–1.04)
MC5	11	0.62 ± 0.037	(0.58–0.70)
MC6	11	0.65 ± 0.048	(0.60–0.72)

APPENDIX 2—(*Continued*)

MC7	11	0.53 ± 0.066	(0.46–0.66)
F1	11	11.07 ± 0.376	(10.60–11.74)
F2	11	2.35 ± 0.135	(2.10–2.62)
F3	11	1.89 ± 0.150	(1.65–2.22)
F4	11	0.94 ± 0.040	(0.89–1.00)
F5	11	1.83 ± 0.066	(1.76–1.94)
F6	11	0.86 ± 0.069	(0.72–0.97)
F7	11	0.91 ± 0.050	(0.84–0.98)
T1	11	12.01 ± 0.424	(11.32–12.60)
T2	11	2.12 ± 0.099	(2.04–2.41)
T3	11	1.39 ± 0.057	(1.29–1.45)
T4	11	1.37 ± 0.041	(1.31–1.44)
T5	11	1.05 ± 0.030	(1.00–1.10)
T6	11	0.92 ± 0.059	(0.84–1.04)
T7	11	0.81 ± 0.049	(0.68–0.87)
MT1	11	8.63 ± 0.936	(6.90–9.66)
MT2	11	1.01 ± 0.033	(0.94–1.06)
MT3	11	0.94 ± 0.130	(0.67–1.04)
MT4	11	0.98 ± 0.047	(0.89–1.09)
MT5	11	0.67 ± 0.038	(0.60–0.71)
MT6	11	0.691 ± 0.054	(0.64–0.82)
MT7	11	0.630 ± 0.080	(0.47–0.71)
S1	6	7.643 ± 0.254	(7.40–8.09)

Cephalophus maxwelli

H1	1	9.00	MC7	1	0.52
H2	1	9.60	F1	1	12.04
H3	1	1.69	F2	1	2.76
H4	1	1.49	F3	1	2.36
H5	1	1.74	F4	1	1.13
H6	1	0.69	F5	1	2.10
H7	1	0.80	F6	1	1.03
H8	1	0.99	F7	1	1.12
U1	1	10.63	T1	1	12.65
U2	1	2.47	T2	1	2.60
R1	1	8.32	T3	1	1.59
R2	1	1.49	T4	1	1.53
R3	1	0.86	T5	1	1.25
R4	1	1.63	T6	1	1.10
R5	1	1.45	T7	1	0.82
R6	1	0.99	MT1	1	8.94
R7	1	0.55	MT2	1	1.14
MC1	1	7.33	MT3	1	1.14
MC2	1	1.28	MT4	1	1.23
MC3	1	0.77	MT5	1	0.81
MC4	1	1.14	MT6	1	0.84
MC5	1	0.71	MT7	1	0.68
MC6	1	0.78	S1	1	8.72

Sylvicapra grimmea

H1	11	10.69 ± 0.695	(8.79–11.36)
H2	11	11.68 ± 0.789	(9.49–12.37)
H3	11	2.01 ± 0.176	(1.67–2.34)
H4	11	1.86 ± 0.138	(1.51–2.02)
H5	11	2.16 ± 0.184	(1.74–2.45)
H6	11	0.81 ± 0.075	(0.75–0.96)
H7	11	1.00 ± 0.094	(0.80–1.13)
H8	11	1.20 ± 0.089	(0.98–1.29)
U1	11	15.13 ± 1.567	(11.20–17.18)
U2	11	2.92 ± 0.407	(1.98–3.49)
R1	11	12.16 ± 1.354	(8.96–14.04)
R2	11	1.83 ± 0.161	(1.48–2.03)
R3	11	1.10 ± 0.088	(0.90–1.23)
R4	11	1.95 ± 0.174	(1.55–2.16)
R5	11	1.81 ± 0.168	(1.49–2.10)
R6	11	1.24 ± 0.107	(0.99–1.38)
R7	11	0.73 ± 0.067	(0.61–0.84)
MC1	11	11.86 ± 1.367	(9.17–13.92)
MC2	11	1.59 ± 0.128	(1.25–1.75)
MC3	11	1.04 ± 0.102	(0.80–1.21)
MC4	11	1.41 ± 0.073	(1.23–1.51)
MC5	11	0.93 ± 0.086	(0.76–1.06)
MC6	11	0.98 ± 0.089	(0.76–1.09)
MC7	11	0.82 ± 0.076	(0.68–0.95)
F1	11	14.94 ± 0.885	(12.91–16.11)
F2	11	3.38 ± 0.283	(2.76–3.94)
F3	11	2.53 ± 0.158	(2.33–2.80)
F4	11	1.41 ± 0.120	(1.22–1.60)
F5	11	2.70 ± 0.234	(2.34–3.19)
F6	11	1.28 ± 0.121	(1.04–1.44)
F7	11	1.25 ± 0.110	(1.02–1.46)
T1	11	17.19 ± 1.174	(14.99–19.39)
T2	11	3.20 ± 0.226	(2.74–3.58)
T3	11	2.06 ± 0.124	(1.84–2.24)
T4	11	1.98 ± 0.132	(1.81–2.26)
T5	11	1.57 ± 0.115	(1.29–1.74)
T6	11	1.31 ± 0.122	(1.06–1.51)
T7	11	1.23 ± 0.140	(0.94–1.41)
MT1	11	13.48 ± 1.669	(9.75–15.70)
MT2	11	1.59 ± 0.117	(1.32–1.79)
MT3	11	1.57 ± 0.149	(1.32–1.88)
MT4	11	1.58 ± 0.063	(1.49–1.74)
MT5	11	1.07 ± 0.071	(0.95–1.20)
MT6	11	1.03 ± 0.090	(0.83–1.19)
MT7	11	1.03 ± 0.090	(0.85–1.17)
S1	9	10.48 ± 1.008	(8.37–12.13)

Kobus ellipsiprymnus

H1	3	20.76 ± 2.856	(17.48–22.70)
H2	3	23.88 ± 3.660	(19.66–26.00)
H3	3	5.37 ± 1.079	(4.13–6.02)
H4	3	5.00 ± 0.988	(3.86–5.62)
H5	3	5.50 ± 0.880	(4.49–6.02)
H6	3	2.06 ± 0.309	(1.72–2.32)
H7	3	2.84 ± 0.563	(2.20–3.25)
H8	3	3.35 ± 0.701	(2.54–3.78)
U1	3	31.26 ± 4.315	(26.28–33.90)
U2	3	7.06 ± 1.016	(5.89–7.68)
R1	3	24.08 ± 2.994	(20.64–26.10)
R2	3	4.99 ± 0.966	(3.88–5.61)
R3	3	2.81 ± 0.466	(2.28–3.16)
R4	3	5.57 ± 1.062	(4.35–6.20)

APPENDIX 2—(*Continued*)

R5	3	4.66 ± 0.823	(3.71–5.18)
R6	3	3.23 ± 0.592	(2.55–3.61)
R7	3	1.92 ± 0.286	(1.59–2.11)
MC1	3	21.40 ± 1.294	(19.91–22.20)
MC2	3	3.59 ± 0.759	(3.08–4.40)
MC3	3	2.46 ± 0.450	(1.94–2.73)
MC4	3	3.96 ± 0.721	(3.13–4.38)
MC5	3	2.07 ± 0.434	(1.60–2.45)
MC6	3	2.34 ± 0.364	(1.93–2.62)
MC7	3	2.08 ± 0.300	(1.74–2.26)
F1	3	29.74 ± 3.657	(25.52–32.00)
F2	3	8.06 ± 1.635	(6.20–9.26)
F3	3	6.10 ± 1.022	(4.92–6.73)
F4	3	3.22 ± 0.560	(2.58–3.58)
F5	3	6.03 ± 1.038	(4.84–6.70)
F6	3	2.87 ± 0.497	(2.30–3.22)
F7	3	3.14 ± 0.659	(2.40–3.66)
T1	3	32.25 ± 3.217	(28.57–34.50)
T2	3	7.20 ± 1.268	(5.76–8.14)
T3	3	4.70 ± 0.710	(3.90–5.24)
T4	3	4.54 ± 0.688	(3.77–5.08)
T5	3	3.49 ± 0.554	(2.87–3.94)
T6	3	3.16 ± 0.502	(2.61–3.59)
T7	3	2.61 ± 0.482	(2.08–3.02)
MT1	3	21.55 ± 1.038	(20.37–22.30)
MT2	3	3.65 ± 0.679	(2.87–4.08)
MT3	3	3.60 ± 0.554	(2.96–3.92)
MT4	3	3.96 ± 0.541	(3.34–4.34)
MT5	3	2.19 ± 0.384	(1.75–2.44)
MT6	3	2.18 ± 0.333	(1.80–2.41)
MT7	3	2.34 ± 0.280	(2.02–2.54)
S1	1	19.62	

Kobus defassa

H1	3	22.73 ± 0.808	(21.80–23.20)
H2	3	26.56 ± 0.611	(25.90–27.10)
H3	3	5.86 ± 0.190	(5.74–6.08)
H4	3	5.51 ± 0.285	(5.23–5.80)
H5	3	5.96 ± 0.245	(5.72–6.21)
H6	3	2.12 ± 0.057	(2.09–2.19)
H7	3	2.96 ± 0.219	(2.71–3.10)
H8	3	3.81 ± 0.414	(3.36–4.17)
U1	3	33.66 ± 1.960	(31.60–35.50)
U2	3	7.61 ± 0.502	(7.04–7.99)
R1	3	25.70 ± 1.571	(24.00–27.10)
R2	3	5.54 ± 0.257	(5.38–5.84)
R3	3	2.99 ± 0.256	(2.72–3.23)
R4	3	6.10 ± 0.240	(5.90–6.37)
R5	3	5.26 ± 0.296	(4.98–5.57)
R6	3	3.50 ± 0.249	(3.22–3.69)
R7	3	2.12 ± 0.132	(1.98–2.24)
MC1	3	22.96 ± 0.986	(22.30–24.10)
MC2	3	4.39 ± 0.265	(4.09–4.58)
MC3	3	2.69 ± 0.185	(2.50–2.87)
MC4	3	4.42 ± 0.342	(4.05–4.72)
MC5	3	2.96 ± 1.204	(2.09–4.34)
MC6	3	2.56 ± 0.220	(2.31–2.71)
MC7	3	2.26 ± 0.110	(2.14–2.34)
F1	3	32.86 ± 1.331	(31.40–34.00)
F2	3	9.68 ± 0.430	(9.20–10.02)
F3	3	6.72 ± 0.593	(6.34–7.41)
F4	3	3.70 ± 0.165	(3.54–3.87)
F5	3	6.83 ± 0.260	(6.67–7.13)
F6	3	3.16 ± 0.090	(3.07–3.25)
F7	3	3.57 ± 0.316	(3.27–3.90)
T1	3	34.46 ± 2.100	(32.40–36.60)
T2	3	8.33 ± 0.200	(8.18–8.56)
T3	3	5.31 ± 0.174	(5.19–5.51)
T4	3	5.20 ± 0.226	(4.96–5.41)
T5	3	3.85 ± 0.237	(3.66–4.12)
T6	3	3.29 ± 0.209	(3.06–3.47)
T7	3	3.00 ± 0.357	(2.70–3.40)
MT1	3	22.60 ± 1.014	(21.70–23.70)
MT2	3	4.02 ± 0.285	(3.70–4.25)
MT3	3	3.91 ± 0.242	(3.63–4.05)
MT4	3	4.61 ± 0.140	(4.46–4.73)
MT5	3	2.55 ± 0.060	(2.51–2.62)
MT6	3	2.48 ± 0.172	(2.29–2.61)
MT7	3	2.71 ± 0.063	(2.68–2.79)
S1	3	28.60 ± 1.769	(26.70–30.20)

Kobus kob kob

H1	1	16.50	MC7	1	1.62
H2	1	18.80	F1	1	22.80
H3	1	3.70	F2	1	5.73
H4	1	3.45	F3	1	4.32
H5	1	3.84	F4	1	2.11
H6	1	1.58	F5	1	4.43
H7	1	1.81	F6	1	2.12
H8	1	2.28	F7	1	2.20
U1	1	23.90	T1	1	27.60
U2	1	5.35	T2	1	5.40
R1	1	18.90	T3	1	3.62
R2	1	3.48	T4	1	3.24
R3	1	1.99	T5	1	2.59
R4	1	3.71	T6	1	2.06
R5	1	3.24	T7	1	2.00
R6	1	2.34	MT1	1	18.30
R7	1	1.25	MT2	1	2.62
MC1	1	17.70	MT3	1	2.63
MC2	1	2.78	MT4	1	2.93
MC3	1	1.81	MT5	1	1.64
MC4	1	2.79	MT6	1	1.54
MC5	1	1.55	MT7	1	1.84
MC6	1	1.70	S1	0	

Kobus kob leucotis

H1	5	17.86 ± 0.642	(17.20–18.90)
H2	5	20.46 ± 0.586	(19.70–21.90)
H3	5	4.28 ± 0.267	(4.02–4.71)
H4	5	3.93 ± 0.161	(3.77–4.18)
H5	5	4.37 ± 0.214	(4.06–4.63)
H6	5	1.62 ± 0.155	(1.50–1.88)

APPENDIX 2—(*Continued*)

H7	5	2.12 ± 0.159	(1.90–2.28)
H8	5	2.58 ± 0.143	(2.46–2.80)
U1	5	26.40 ± 1.303	(25.20–28.60)
U2	5	5.67 ± 0.426	(5.31–6.21)
R1	5	20.60 ± 1.058	(19.60–22.40)
R2	5	3.92 ± 0.131	(3.72–4.07)
R3	5	2.17 ± 0.101	(2.05–2.33)
R4	5	4.29 ± 0.205	(4.10–4.63)
R5	5	3.70 ± 0.234	(3.32–3.93)
R6	5	2.57 ± 0.206	(2.37–2.88)
R7	5	1.48 ± 0.110	(1.34–1.62)
MC1	5	19.78 ± 0.481	(19.20–20.30)
MC2	5	3.08 ± 0.133	(2.93–3.27)
MC3	5	2.00 ± 0.096	(1.91–2.14)
MC4	5	3.12 ± 0.220	(2.91–3.42)
MC5	5	1.67 ± 0.099	(1.57–1.79)
MC6	5	1.93 ± 0.142	(1.78–2.09)
MC7	5	1.68 ± 0.073	(1.61–1.78)
F1	5	25.74 ± 0.820	(25.30–27.20)
F2	5	6.23 ± 0.321	(5.92–6.76)
F3	5	4.91 ± 0.228	(4.61–5.20)
F4	5	2.63 ± 0.165	(2.45–2.83)
F5	5	5.04 ± 0.322	(4.66–5.48)
F6	5	2.39 ± 0.138	(2.17–2.54)
F7	5	2.44 ± 0.215	(2.09–2.62)
T1	5	29.46 ± 1.108	(28.70–31.40)
T2	5	6.02 ± 0.273	(5.62–6.34)
T3	5	4.50 ± 0.868	(3.71–5.93)
T4	5	3.76 ± 0.175	(3.49–3.97)
T5	5	2.87 ± 0.104	(2.70–2.98)
T6	5	2.49 ± 0.189	(2.27–2.73)
T7	5	2.27 ± 0.249	(1.84–2.44)
MT1	5	20.12 ± 0.614	(19.40–20.80)
MT2	5	2.94 ± 0.125	(2.79–3.13)
MT3	5	2.88 ± 0.177	(2.72–3.17)
MT4	5	3.28 ± 0.205	(2.98–3.54)
MT5	5	1.82 ± 0.088	(1.72–1.91)
MT6	5	1.83 ± 0.119	(1.70–1.98)
MT7	5	1.99 ± 0.149	(1.76–2.17)
S1	3	20.86 ± 0.723	(20.40–21.70)

Kobus kob thomasi

H1	2	17.50 ± 1.555	(16.40–18.60)
H2	2	20.05 ± 1.909	(18.70–21.40)
H3	2	4.10 ± 0.374	(3.84–4.37)
H4	2	3.96 ± 0.332	(3.73–4.20)
H5	2	4.31 ± 0.388	(4.04–4.59)
H6	2	1.70 ± 0.197	(1.56–1.84)
H7	2	1.98 ± 0.190	(1.85–2.12)
H8	2	2.49 ± 0.268	(2.30–2.68)
U1	2	25.95 ± 3.040	(23.80–28.10)
U2	2	5.67 ± 0.735	(5.15–6.19)
R1	2	20.30 ± 1.838	(19.00–21.60)
R2	2	4.01 ± 0.318	(3.79–4.24)
R3	2	2.30 ± 0.212	(2.15–2.45)
R4	2	4.40 ± 0.339	(4.16–4.64)
R5	2	3.54 ± 0.304	(3.33–3.76)
R6	2	2.51 ± 0.247	(2.34–2.69)
R7	2	1.32 ± 0.197	(1.18–1.46)
MC1	2	20.40 ± 1.414	(19.40–21.40)
MC2	2	2.98 ± 0.190	(2.85–3.12)
MC3	2	2.08 ± 0.056	(2.04–2.12)
MC4	2	3.10 ± 0.311	(2.88–3.32)
MC5	2	1.77 ± 0.169	(1.65–1.89)
MC6	2	1.77 ± 0.120	(1.69–1.86)
MC7	2	1.78 ± 0.183	(1.65–1.91)
F1	2	25.65 ± 2.050	(24.20–27.10)
F2	2	6.75 ± 0.509	(6.39–7.11)
F3	2	4.95 ± 0.261	(4.77–5.14)
F4	2	2.59 ± 0.007	(2.59–2.60)
F5	2	5.05 ± 0.120	(4.97–5.14)
F6	2	2.16 ± 0.240	(1.99–2.33)
F7	2	2.40 ± 0.233	(2.24–2.57)
T1	2	29.60 ± 2.262	(28.00–31.20)
T2	2	5.59 ± 0.120	(5.87–6.04)
T3	2	4.21 ± 0.035	(4.19–4.24)
T4	2	3.86 ± 0.240	(3.69–4.03)
T5	2	2.78 ± 0.113	(2.70–2.86)
T6	2	2.45 ± 0.084	(2.39–2.51)
T7	2	2.12 ± 0.021	(2.11–2.14)
MT1	2	20.70 ± 1.838	(19.40–22.00)
MT2	2	3.00 ± 0.021	(2.99–3.02)
MT3	2	2.89 ± 0.077	(2.84–2.95)
MT4	2	3.33 ± 0.176	(3.21–3.46)
MT5	2	1.92 ± 0.014	(1.91–1.93)
MT6	2	1.76 ± 0.219	(1.61–1.92)
MT7	2	2.01 ± 0.197	(1.87–2.15)
S1	2	20.85 ± 1.484	(19.80–21.90)

Kobus vardoni

H1	2	17.15 ± 0.636	(16.70–17.60)
H2	2	19.50 ± 0.282	(19.30–19.70)
H3	2	4.22 ± 0.261	(4.04–4.41)
H4	2	3.98 ± 0.205	(3.84–4.13)
H5	2	4.44 ± 0.275	(4.25–4.64)
H6	2	1.84 ± 0.148	(1.74–1.95)
H7	2	2.10 ± 0.021	(2.09–2.12)
H8	2	2.67 ± 0.098	(2.60–2.74)
U1	2	24.75 ± 1.343	(23.80–25.70)
U2	2	5.78 ± 0.219	(5.63–5.94)
R1	2	19.15 ± 1.060	(18.40–19.90)
R2	2	3.93 ± 0.205	(3.79–4.08)
R3	2	2.24 ± 0.098	(2.17–2.31)
R4	2	4.23 ± 0.070	(4.18–4.28)
R5	2	3.67 ± 0.028	(3.65–3.69)
R6	2	2.42 ± 0.014	(2.41–2.43)
R7	2	1.46 ± 0.000	(1.46–1.46)
MC1	2	18.55 ± 0.494	(18.20–18.90)
MC2	2	3.03 ± 0.021	(3.02–3.05)
MC3	2	1.97 ± 0.000	(1.97–1.97)
MC4	2	3.05 ± 0.049	(3.02–3.09)
MC5	2	1.70 ± 0.056	(1.66–1.74)

APPENDIX 2—(*Continued*)

MC6	2	1.96 ± 0.205	(1.82–2.11)
MC7	2	1.72 ± 0.070	(1.67–1.77)
F1	2	25.30 ± 1.414	(24.30–26.30)
F2	2	6.61 ± 0.190	(6.48–6.75)
F3	2	5.00 ± 0.219	(4.85–5.16)
F4	2	2.53 ± 0.007	(2.53–2.54)
F5	2	4.97 ± 0.148	(4.87–5.08)
F6	2	2.29 ± 0.070	(2.24–2.34)
F7	2	2.31 ± 0.127	(2.22–2.40)
T1	2	28.00 ± 1.414	(27.00–29.00)
T2	2	5.94 ± 0.219	(5.79–6.10)
T3	2	3.92 ± 0.014	(3.91–3.93)
T4	2	3.65 ± 0.042	(3.62–3.68)
T5	2	2.75 ± 0.049	(2.72–2.79)
T6	2	2.46 ± 0.070	(2.41–2.51)
T7	2	2.13 ± 0.035	(2.11–2.16)
MT1	2	18.65 ± 0.494	(18.30–19.00)
MT2	2	2.87 ± 0.007	(2.87–2.88)
MT3	2	2.97 ± 0.113	(2.89–3.05)
MT4	2	3.21 ± 0.077	(3.16–3.27)
MT5	2	1.85 ± 0.014	(1.84–1.86)
MT6	2	1.88 ± 0.212	(1.73–2.03)
MT7	2	1.99 ± 0.028	(1.97–2.01)
S1	1	20.50	

Kobus leche

H1	2	20.25 ± 0.777	(19.70–20.80)
H2	2	22.70 ± 0.989	(22.00–23.40)
H3	2	4.66 ± 0.169	(4.54–4.78)
H4	2	4.15 ± 0.007	(4.15–4.16)
H5	2	4.81 ± 0.240	(4.64–4.98)
H6	2	1.76 ± 0.106	(1.69–1.84)
H7	2	2.22 ± 0.141	(2.12–2.32)
H8	2	2.70 ± 0.233	(2.54–2.87)
U1	2	29.80 ± 0.282	(29.60–30.00)
U2	2	5.82 ± 0.091	(5.76–5.89)
R1	2	23.05 ± 0.212	(22.90–23.20)
R2	2	4.12 ± 0.084	(4.06–4.18)
R3	2	2.38 ± 0.091	(2.32–2.45)
R4	2	4.51 ± 0.091	(4.45–4.58)
R5	2	3.99 ± 0.233	(3.83–4.16)
R6	2	2.57 ± 0.134	(2.48–2.67)
R7	2	1.55 ± 0.098	(1.48–1.62)
MC1	2	22.40 ± 0.424	(22.10–22.70)
MC2	2	3.32 ± 0.169	(3.20–3.44)
MC3	2	2.17 ± 0.098	(2.10–2.24)
MC4	2	3.22 ± 0.063	(3.18–3.27)
MC5	2	1.99 ± 0.042	(1.96–2.02)
MC6	2	1.94 ± 0.205	(1.80–2.09)
MC7	2	1.77 ± 0.035	(1.75–1.80)
F1	2	28.05 ± 0.919	(27.40–28.70)
F2	2	7.23 ± 0.098	(7.16–7.30)
F3	2	5.62 ± 0.325	(5.39–5.85)
F4	2	2.89 ± 0.063	(2.85–2.94)
F5	2	5.40 ± 0.148	(5.30–5.51)
F6	2	2.54 ± 0.254	(2.36–2.72)
F7	2	2.57 ± 0.169	(2.45–2.69)
T1	2	32.50 ± 0.565	(32.10–32.90)
T2	2	6.30 ± 0.212	(6.15–6.45)
T3	2	4.53 ± 0.289	(4.33–4.74)
T4	2	3.90 ± 0.176	(3.78–4.03)
T5	2	3.08 ± 0.091	(3.02–3.15)
T6	2	2.54 ± 0.106	(2.47–2.62)
T7	2	2.34 ± 0.056	(2.30–2.38)
MT1	2	23.25 ± 0.070	(23.20–23.30)
MT2	2	3.11 ± 0.077	(3.06–3.17)
MT3	2	3.07 ± 0.141	(2.97–3.17)
MT4	2	3.46 ± 0.091	(3.40–3.53)
MT5	2	2.11 ± 0.063	(2.07–2.16)
MT6	2	1.81 ± 0.134	(1.72–1.91)
MT7	2	2.06 ± 0.021	(2.05–2.08)
S1	0		

Kobus megaceros

H1	5	17.96 ± 1.158	(16.80–19.70)
H2	5	20.46 ± 1.242	(19.10–22.30)
H3	5	4.16 ± 0.402	(3.61–4.62)
H4	5	3.91 ± 0.233	(3.72–4.27)
H5	5	4.25 ± 0.309	(3.98–4.60)
H6	5	1.65 ± 0.104	(1.53–1.78)
H7	5	2.04 ± 0.178	(1.84–2.24)
H8	5	2.65 ± 0.241	(2.42–2.98)
U1	5	26.30 ± 1.621	(24.40–28.80)
U2	5	5.41 ± 0.492	(4.90–6.06)
R1	5	20.74 ± 1.256	(19.20–22.60)
R2	5	3.87 ± 0.199	(3.68–4.09)
R3	5	2.15 ± 0.122	(2.07–2.37)
R4	5	4.20 ± 0.220	(3.97–4.48)
R5	5	3.73 ± 0.255	(3.52–4.06)
R6	5	2.52 ± 0.214	(2.34–2.77)
R7	5	1.51 ± 0.158	(1.31–1.69)
MC1	5	20.26 ± 1.145	(18.50–21.70)
MC2	5	3.06 ± 0.198	(2.87–3.34)
MC3	5	2.01 ± 0.094	(1.89–2.11)
MC4	5	3.07 ± 0.181	(2.90–3.29)
MC5	5	1.75 ± 0.053	(1.71–1.84)
MC6	5	1.84 ± 0.168	(1.66–2.05)
MC7	5	1.70 ± 0.107	(1.59–1.87)
F1	5	25.60 ± 1.185	(24.20–27.30)
F2	5	6.24 ± 0.609	(5.57–7.03)
F3	5	4.73 ± 0.548	(4.10–5.55)
F4	5	2.50 ± 0.182	(2.22–2.73)
F5	5	4.87 ± 0.267	(4.58–5.31)
F6	5	2.34 ± 0.234	(2.05–2.58)
F7	5	2.41 ± 0.252	(2.06–2.69)
T1	5	29.66 ± 1.310	(27.80–31.40)
T2	5	5.89 ± 0.366	(5.49–6.49)
T3	5	3.92 ± 0.287	(3.52–4.23)
T4	5	3.72 ± 0.172	(3.58–4.01)
T5	5	2.75 ± 0.120	(2.64–2.92)
T6	5	2.51 ± 0.187	(2.24–2.76)
T7	5	2.11 ± 0.144	(1.87–2.26)

APPENDIX 2—(*Continued*)

MT1	5	20.76 ± 1.467	(19.00–22.90)
MT2	5	2.85 ± 0.167	(2.66–3.12)
MT3	5	2.85 ± 0.185	(2.58–3.05)
MT4	5	3.25 ± 0.165	(3.12–3.48)
MT5	5	1.92 ± 0.100	(1.79–2.02)
MT6	5	1.83 ± 0.146	(1.63–1.99)
MT7	5	1.98 ± 0.117	(1.79–2.09)
S1	4	20.00 ± 0.391	(19.50–20.40)

Redunca arundinum

H1	5	15.81 ± 1.574	(13.76–17.30)
H2	5	17.82 ± 1.798	(15.52–19.60)
H3	5	3.60 ± 0.408	(2.96–4.00)
H4	5	3.27 ± 0.378	(2.67–3.59)
H5	5	3.58 ± 0.476	(2.94–4.16)
H6	5	1.36 ± 0.155	(1.12–1.50)
H7	5	1.74 ± 0.255	(1.37–2.00)
H8	5	2.08 ± 0.212	(1.78–2.28)
U1	5	26.18 ± 3.948	(20.20–29.50)
U2	5	5.09 ± 0.865	(3.84–5.91)
R1	5	20.98 ± 3.182	(16.23–23.70)
R2	5	3.26 ± 0.346	(2.70–3.57)
R3	5	1.98 ± 0.296	(1.58–2.35)
R4	5	3.52 ± 0.363	(2.95–3.88)
R5	5	3.22 ± 0.375	(2.67–3.59)
R6	5	2.11 ± 0.253	(1.74–2.35)
R7	5	1.27 ± 0.234	(0.98–1.58)
MC1	5	22.31 ± 3.409	(16.68–24.80)
MC2	5	2.62 ± 0.306	(2.19–2.93)
MC3	5	1.79 ± 0.245	(1.41–2.08)
MC4	5	2.60 ± 0.293	(2.12–2.86)
MC5	5	1.68 ± 0.319	(1.20–2.04)
MC6	5	1.65 ± 0.147	(1.45–1.79)
MC7	5	1.52 ± 0.249	(1.15–1.74)
F1	5	23.91 ± 2.977	(18.96–26.10)
F2	5	5.26 ± 0.618	(4.44–6.10)
F3	5	4.23 ± 0.519	(3.44–4.70)
F4	5	2.19 ± 0.292	(1.70–2.42)
F5	5	4.42 ± 0.594	(3.41–4.87)
F6	5	2.05 ± 0.224	(1.70–2.25)
F7	5	2.06 ± 0.331	(1.60–2.41)
T1	5	29.30 ± 3.903	(23.41–32.50)
T2	5	5.26 ± 0.622	(4.25–5.78)
T3	5	3.66 ± 0.452	(2.99–4.17)
T4	5	3.31 ± 0.361	(2.75–3.70)
T5	5	2.45 ± 0.272	(2.01–2.69)
T6	5	2.11 ± 0.223	(1.76–2.33)
T7	5	1.80 ± 0.229	(1.44–2.03)
MT1	5	23.01 ± 3.567	(17.17–25.50)
MT2	5	2.53 ± 0.301	(2.03–2.80)
MT3	5	2.68 ± 0.328	(2.19–3.04)
MT4	5	2.72 ± 0.323	(2.18–2.97)
MT5	5	1.70 ± 0.227	(1.34–1.95)
MT6	5	1.64 ± 0.179	(1.36–1.78)
MT7	5	1.79 ± 0.293	(1.33–2.04)
S1	5	18.48 ± 2.595	(14.57–20.40)

Redunca fulvorufula

H1	7	13.92 ± 0.457	(13.10–14.50)
H2	7	15.60 ± 0.535	(14.80–16.30)
H3	7	3.07 ± 0.131	(2.92–3.22)
H4	7	2.71 ± 0.056	(2.64–2.79)
H5	7	3.00 ± 0.121	(2.81–3.20)
H6	7	1.18 ± 0.057	(1.10–1.26)
H7	7	1.42 ± 0.049	(1.37–1.50)
H8	7	1.78 ± 0.047	(1.72–1.86)
U1	7	21.05 ± 0.727	(19.70–21.90)
U2	7	3.95 ± 0.185	(3.67–4.19)
R1	7	16.84 ± 0.632	(15.60–17.50)
R2	7	2.67 ± 0.058	(2.60–2.77)
R3	7	1.59 ± 0.035	(1.54–1.64)
R4	7	2.90 ± 0.080	(2.81–3.04)
R5	7	2.70 ± 0.044	(2.65–2.78)
R6	7	1.82 ± 0.035	(1.79–1.89)
R7	7	1.02 ± 0.044	(0.96–1.10)
MC1	7	17.24 ± 0.544	(16.20–18.00)
MC2	7	2.21 ± 0.045	(2.14–2.27)
MC3	7	1.41 ± 0.056	(1.29–1.47)
MC4	7	2.13 ± 0.072	(2.02–2.22)
MC5	7	1.35 ± 0.076	(1.22–1.45)
MC6	7	1.35 ± 0.043	(1.29–1.42)
MC7	7	1.24 ± 0.038	(1.19–1.29)
F1	7	19.70 ± 0.690	(18.50–20.80)
F2	7	4.37 ± 0.325	(3.87–4.83)
F3	7	3.36 ± 0.159	(3.10–3.60)
F4	7	1.76 ± 0.042	(1.72–1.84)
F5	7	3.56 ± 0.096	(3.43–3.72)
F6	7	1.67 ± 0.032	(1.62–1.71)
F7	7	1.69 ± 0.088	(1.59–1.81)
T1	7	24.14 ± 0.958	(22.30–25.40)
T2	7	4.25 ± 0.083	(4.08–4.34)
T3	7	2.91 ± 0.105	(2.73–3.04)
T4	7	2.60 ± 0.239	(2.07–2.76)
T5	7	2.18 ± 0.257	(2.04–2.76)
T6	7	1.74 ± 0.080	(1.62–1.81)
T7	7	1.61 ± 0.059	(1.54–1.72)
MT1	7	17.77 ± 0.570	(16.70–18.60)
MT2	7	2.04 ± 0.076	(1.92–2.17)
MT3	7	2.05 ± 0.078	(1.95–2.19)
MT4	7	2.17 ± 0.065	(2.06–2.26)
MT5	7	1.37 ± 0.102	(1.16–1.46)
MT6	7	1.33 ± 0.039	(1.27–1.38)
MT7	7	1.40 ± 0.051	(1.33–1.46)
S1	6	15.29 ± 0.390	(14.71–15.69)

Redunca redunca

H1	6	15.03 ± 0.588	(14.50–16.10)
H2	6	16.86 ± 0.768	(16.20–18.20)
H3	6	3.32 ± 0.198	(3.11–3.69)
H4	6	3.05 ± 0.146	(2.86–3.27)
H5	6	3.42 ± 0.208	(3.15–3.69)
H6	6	1.22 ± 0.079	(1.09–1.33)

APPENDIX 2—(*Continued*)

H7	6	1.67 ± 0.109	(1.53–1.85)
H8	6	1.94 ± 0.174	(1.78–2.20)
U1	6	23.80 ± 1.216	(22.50–25.60)
U2	6	4.37 ± 0.299	(3.95–4.79)
R1	6	18.98 ± 0.820	(18.30–20.40)
R2	6	3.03 ± 0.182	(2.85–3.29)
R3	6	1.78 ± 0.108	(1.65–1.90)
R4	6	3.30 ± 0.183	(3.05–3.53)
R5	6	2.98 ± 0.186	(2.78–3.21)
R6	6	2.03 ± 0.197	(1.80–2.28)
R7	6	1.21 ± 0.078	(1.09–1.32)
MC1	6	20.45 ± 1.055	(19.40–22.20)
MC2	6	2.47 ± 0.144	(2.31–2.67)
MC3	6	1.65 ± 0.088	(1.55–1.79)
MC4	6	2.30 ± 0.154	(2.12–2.54)
MC5	6	1.53 ± 0.114	(1.39–1.70)
MC6	6	1.53 ± 0.109	(1.37–1.67)
MC7	6	1.45 ± 0.082	(1.38–1.57)
F1	6	22.31 ± 0.798	(21.70–23.80)
F2	6	5.27 ± 0.479	(4.68–6.07)
F3	6	3.94 ± 0.193	(3.65–4.21)
F4	6	2.07 ± 0.114	(1.99–2.29)
F5	6	4.07 ± 0.250	(3.85–4.48)
F6	6	1.93 ± 0.103	(1.77–2.08)
F7	6	1.93 ± 0.137	(1.74–2.12)
T1	6	26.71 ± 1.045	(25.80–28.10)
T2	6	4.89 ± 0.284	(4.60–5.35)
T3	6	3.30 ± 0.275	(2.90–3.74)
T4	6	3.13 ± 0.172	(2.84–3.35)
T5	6	2.40 ± 0.096	(2.30–2.54)
T6	6	1.99 ± 0.149	(1.81–2.16)
T7	6	1.95 ± 0.212	(1.79–2.34)
MT1	6	20.66 ± 1.191	(19.30–22.50)
MT2	6	2.29 ± 0.112	(2.16–2.48)
MT3	6	2.44 ± 0.181	(2.20–2.62)
MT4	6	2.54 ± 0.182	(2.34–2.80)
MT5	6	1.63 ± 0.109	(1.47–1.77)
MT6	6	1.56 ± 0.119	(1.44–1.76)
MT7	6	1.67 ± 0.090	(1.55–1.78)
S1	6	17.85 ± 0.990	(16.80–18.99)

Pelea capreolus

H1	1	13.70	MC7	1	1.07
H2	1	15.20	F1	1	19.40
H3	1	2.76	F2	1	4.47
H4	1	2.66	F3	1	3.27
H5	1	2.76	F4	1	1.74
H6	1	1.23	F5	1	3.58
H7	1	1.23	F6	1	1.59
H8	1	1.58	F7	1	1.53
U1	1	22.40	T1	1	25.10
U2	1	3.92	T2	1	4.02
R1	1	17.90	T3	1	2.60
R2	1	2.56	T4	1	2.56
R3	1	1.37	T5	1	1.98
R4	1	2.72	T6	1	1.60
R5	1	2.56	T7	1	1.32
R6	1	1.48	MT1	1	20.00
R7	1	0.92	MT2	1	1.97
MC1	1	19.00	MT3	1	1.92
MC2	1	2.24	MT4	1	2.10
MC3	1	1.38	MT5	1	1.33
MC4	1	1.95	MT6	1	1.26
MC5	1	1.17	MT7	1	1.31
MC6	1	1.24	S1	0	

Hippotragus niger

H1	13	23.70 ± 1.620	(21.00–27.70)
H2	13	26.33 ± 2.025	(23.20–31.50)
H3	13	5.85 ± 0.446	(5.31–6.77)
H4	13	5.71 ± 0.387	(5.32–6.73)
H5	13	6.19 ± 0.461	(5.49–7.13)
H6	13	2.41 ± 0.188	(2.02–2.70)
H7	13	3.22 ± 0.247	(2.75–3.57)
H8	13	3.69 ± 0.281	(3.27–4.24)
U1	13	37.60 ± 2.529	(33.30–42.90)
U2	13	8.56 ± 0.673	(7.23–9.78)
R1	13	29.89 ± 2.153	(26.10–34.60)
R2	13	5.70 ± 0.409	(5.32–6.85)
R3	13	4.75 ± 6.145	(2.87–25.20)
R4	13	7.86 ± 6.033	(5.80–27.90)
R5	13	5.75 ± 0.347	(5.39–6.59)
R6	13	3.71 ± 0.727	(3.07–5.96)
R7	13	2.53 ± 1.317	(1.86–6.87)
MC1	13	21.96 ± 6.175	(2.39–27.50)
MC2	13	4.46 ± 0.392	(3.50–5.16)
MC3	13	2.89 ± 0.441	(2.29–4.04)
MC4	13	7.24 ± 9.909	(4.03–40.20)
MC5	13	2.95 ± 1.807	(2.27–8.95)
MC6	13	4.85 ± 8.040	(2.33–31.60)
MC7	13	2.41 ± 1.055	(1.87–5.87)
F1	13	31.56 ± 2.075	(28.10–36.70)
F2	13	9.34 ± 0.571	(8.51–10.28)
F3	13	6.49 ± 0.565	(5.71–7.74)
F4	13	3.64 ± 0.241	(3.33–4.12)
F5	13	7.10 ± 0.404	(6.53–7.93)
F6	13	3.06 ± 0.316	(2.54–3.53)
F7	13	3.26 ± 0.291	(2.93–3.88)
T1	13	33.80 ± 2.527	(30.30–39.80)
T2	13	8.39 ± 0.537	(7.86–9.55)
T3	13	5.32 ± 1.025	(4.64–8.58)
T4	13	5.21 ± 0.320	(4.79–5.69)
T5	13	3.87 ± 0.324	(3.29–4.36)
T6	13	3.36 ± 0.256	(2.93–3.75)
T7	13	2.73 ± 0.266	(2.35–3.24)
MT1	13	23.98 ± 2.076	(20.60–28.50)
MT2	13	3.95 ± 0.228	(3.76–4.59)
MT3	13	3.86 ± 0.272	(3.45–4.37)
MT4	13	4.42 ± 0.370	(3.89–5.12)
MT5	13	2.45 ± 0.129	(2.28–2.74)
MT6	13	2.44 ± 0.198	(2.09–2.73)

APPENDIX 2—(*Continued*)

MT7	13	2.47 ± 0.236	(2.12–2.84)
S1	8	30.55 ± 2.232	(27.70–33.70)

Hippotragus equinus

H1	1	25.60	MC7	1	2.58
H2	1	28.70	F1	1	34.10
H3	1	6.15	F2	1	10.13
H4	1	6.37	F3	1	7.09
H5	1	6.48	F4	1	4.21
H6	1	2.22	F5	1	6.98
H7	1	3.80	F6	1	3.33
H8	1	4.00	F7	1	3.67
U1	1	41.90	T1	1	37.90
U2	1	8.98	T2	1	8.84
R1	1	33.60	T3	1	5.86
R2	1	6.29	T4	1	5.64
R3	1	3.36	T5	1	4.40
R4	1	7.02	T6	1	3.74
R5	1	5.64	T7	1	3.49
R6	1	4.55	MT1	1	28.50
R7	1	2.42	MT2	1	4.43
MC1	1	28.00	MT3	1	4.06
MC2	1	5.00	MT4	1	4.99
MC3	1	3.23	MT5	1	2.74
MC4	1	5.08	MT6	1	2.76
MC5	1	3.00	MT7	1	2.94
MC6	1	3.09	S1	0	

Oryx gazella

H1	13	21.75 ± 1.335	(20.10–24.20)
H2	13	24.20 ± 1.371	(22.60–26.60)
H3	13	5.35 ± 0.345	(4.84–5.90)
H4	13	5.41 ± 0.354	(4.94–6.11)
H5	13	5.75 ± 0.420	(5.35–6.56)
H6	13	2.03 ± 0.164	(1.75–2.30)
H7	13	2.96 ± 0.219	(2.59–3.44)
H8	13	3.53 ± 0.258	(3.13–3.99)
U1	13	34.40 ± 1.641	(32.30–38.50)
U2	13	7.58 ± 0.659	(6.82–9.16)
R1	13	27.22 ± 1.353	(26.00–30.70)
R2	13	5.39 ± 0.402	(4.81–6.21)
R3	13	2.80 ± 0.217	(2.55–3.20)
R4	13	6.07 ± 0.419	(5.49–6.92)
R5	13	5.24 ± 0.358	(4.88–6.08)
R6	13	3.16 ± 0.229	(2.86–3.60)
R7	13	1.97 ± 0.166	(1.76–2.32)
MC1	13	21.53 ± 0.759	(20.80–23.40)
MC2	13	4.26 ± 0.325	(3.77–5.16)
MC3	13	2.58 ± 0.180	(2.37–3.04)
MC4	13	4.15 ± 0.287	(3.71–4.73)
MC5	13	2.33 ± 0.238	(2.02–2.76)
MC6	13	2.36 ± 0.180	(2.09–2.67)
MC7	13	2.02 ± 0.143	(1.84–2.35)
F1	13	29.06 ± 1.751	(26.80–32.20)
F2	13	9.15 ± 0.757	(7.89–10.45)
F3	13	6.22 ± 0.410	(5.64–6.91)
F4	13	3.37 ± 0.383	(2.92–4.11)
F5	13	6.34 ± 0.358	(5.76–7.03)
F6	13	3.01 ± 0.296	(2.66–3.47)
F7	13	3.24 ± 0.226	(2.91–3.58)
T1	13	31.19 ± 1.808	(29.00–35.20)
T2	13	7.57 ± 0.478	(7.16–8.74)
T3	13	4.73 ± 0.391	(4.18–5.48)
T4	13	4.73 ± 0.721	(2.53–5.57)
T5	13	3.50 ± 0.193	(3.16–3.86)
T6	13	3.10 ± 0.210	(2.80–3.43)
T7	13	2.62 ± 0.221	(2.27–3.05)
MT1	13	22.94 ± 1.050	(21.80–25.60)
MT2	13	3.82 ± 0.223	(3.49–4.34)
MT3	13	3.62 ± 0.203	(3.33–4.11)
MT4	13	4.14 ± 0.324	(3.71–4.68)
MT5	13	2.38 ± 0.221	(2.07–2.74)
MT6	13	2.25 ± 0.211	(1.97–2.67)
MT7	13	2.39 ± 0.178	(2.14–2.71)
S1	10	30.05 ± 2.105	(27.90–33.80)

Oryx leucoryx

H1	2	17.49 ± 2.128	(15.99–19.00)
H2	2	19.11 ± 2.107	(17.62–20.60)
H3	2	3.85 ± 0.381	(3.58–4.12)
H4	2	4.28 ± 0.516	(3.92–4.65)
H5	2	4.49 ± 0.494	(4.14–4.84)
H6	2	1.69 ± 0.155	(1.58–1.80)
H7	2	2.21 ± 0.311	(1.99–2.43)
H8	2	2.71 ± 0.205	(2.57–2.86)
U1	2	28.74 ± 3.471	(26.29–31.20)
U2	2	5.79 ± 0.940	(5.13–6.46)
R1	2	22.99 ± 2.983	(20.88–25.10)
R2	2	4.29 ± 0.452	(3.97–4.61)
R3	2	2.14 ± 0.190	(2.01–2.28)
R4	2	4.82 ± 0.615	(4.39–5.26)
R5	2	4.13 ± 0.544	(3.75–4.52)
R6	2	2.37 ± 0.254	(2.19–2.55)
R7	2	1.36 ± 0.098	(1.29–1.43)
MC1	2	18.42 ± 2.368	(16.75–20.10)
MC2	2	3.56 ± 0.367	(3.30–3.82)
MC3	2	1.95 ± 0.233	(1.79–2.12)
MC4	2	3.26 ± 0.410	(2.97–3.55)
MC5	2	1.74 ± 0.134	(1.65–1.84)
MC6	2	1.62 ± 0.169	(1.50–1.74)
MC7	2	1.49 ± 0.197	(1.35–1.63)
F1	2	22.36 ± 3.450	(19.92–24.80)
F2	2	7.02 ± 1.039	(6.29–7.76)
F3	2	4.60 ± 1.025	(3.88–5.33)
F4	2	2.61 ± 0.162	(2.50–2.73)
F5	2	4.87 ± 0.629	(4.43–5.32)
F6	2	2.22 ± 0.381	(1.95–2.49)
F7	2	2.21 ± 0.381	(1.94–2.48)
T1	2	25.15 ± 3.316	(22.81–27.50)
T2	2	5.84 ± 0.763	(5.30–6.38)

APPENDIX 2—(*Continued*)

T3	2	3.13 ± 0.346	(2.89–3.38)
T4	2	3.77 ± 0.480	(3.43–4.11)
T5	2	2.80 ± 0.367	(2.54–3.06)
T6	2	2.34 ± 0.417	(2.05–2.64)
T7	2	1.72 ± 0.183	(1.59–1.85)
MT1	2	20.06 ± 2.036	(18.62–21.50)
MT2	2	3.04 ± 0.346	(2.80–3.29)
MT3	2	2.83 ± 0.473	(2.50–3.17)
MT4	2	3.30 ± 0.417	(3.01–3.60)
MT5	2	1.80 ± 0.205	(1.66–1.95)
MT6	2	1.62 ± 0.261	(1.44–1.81)
MT7	2	1.73 ± 0.233	(1.57–1.90)
S1	2	22.37 ± 2.156	(20.85–23.90)

Oryx tao

H1	2	20.30 ± 0.565	(19.90–20.70)
H2	2	22.45 ± 0.636	(22.00–22.90)
H3	2	4.66 ± 0.183	(4.53–4.79)
H4	2	4.97 ± 0.162	(4.86–5.09)
H5	2	5.36 ± 0.169	(5.24–5.48)
H6	2	2.19 ± 0.056	(2.15–2.23)
H7	2	2.61 ± 0.014	(2.60–2.62)
H8	2	3.16 ± 0.148	(3.06–3.27)
U1	2	33.95 ± 1.909	(32.60–35.30)
U2	2	7.11 ± 0.466	(6.78–7.44)
R1	2	27.30 ± 1.555	(26.20–28.40)
R2	2	5.01 ± 0.282	(4.81–5.21)
R3	2	2.68 ± 0.148	(2.58–2.79)
R4	2	5.72 ± 0.353	(5.47–5.97)
R5	2	4.78 ± 0.325	(4.55–5.01)
R6	2	2.90 ± 0.021	(2.89–2.92)
R7	2	1.80 ± 0.077	(1.75–1.86)
MC1	2	21.35 ± 0.353	(21.10–21.60)
MC2	2	3.84 ± 0.134	(3.75–3.94)
MC3	2	2.39 ± 0.056	(2.35–2.43)
MC4	2	3.86 ± 0.021	(3.85–3.88)
MC5	2	2.10 ± 0.021	(2.09–2.12)
MC6	2	2.00 ± 0.014	(1.99–2.01)
MC7	2	1.56 ± 0.275	(1.37–1.76)
F1	2	27.60 ± 1.838	(26.30–28.90)
F2	2	9.10 ± 0.339	(8.86–9.34)
F3	2	5.95 ± 0.388	(5.68–6.23)
F4	2	3.34 ± 0.155	(3.23–3.45)
F5	2	5.86 ± 0.127	(5.77–5.95)
F6	2	2.80 ± 0.028	(2.78–2.82)
F7	2	2.89 ± 0.148	(2.79–3.00)
T1	2	30.80 ± 1.697	(29.60–32.00)
T2	2	7.16 ± 0.127	(7.07–7.25)
T3	2	4.18 ± 0.261	(4.00–4.37)
T4	2	4.46 ± 0.007	(4.46–4.47)
T5	2	3.30 ± 0.063	(3.26–3.35)
T6	2	2.76 ± 0.028	(2.74–2.78)
T7	2	2.32 ± 0.106	(2.25–2.40)
MT1	2	23.00 ± 0.282	(22.80–23.20)
MT2	2	3.42 ± 0.035	(3.40–3.45)
MT3	2	3.47 ± 0.070	(3.42–3.52)
MT4	2	3.87 ± 0.035	(3.85–3.90)
MT5	2	2.20 ± 0.035	(2.18–2.23)
MT6	2	1.89 ± 0.042	(1.86–1.92)
MT7	2	2.24 ± 0.098	(2.17–2.31)
S1	2	27.05 ± 1.484	(26.00–28.10)

Addax nasomasculatus

H1	4	18.55 ± 0.591	(18.10–19.40)
H2	4	20.22 ± 0.579	(19.60–21.00)
H3	4	4.45 ± 0.106	(4.35–4.60)
H4	4	4.43 ± 0.095	(4.33–4.56)
H5	4	4.59 ± 0.095	(4.50–4.71)
H6	4	1.80 ± 0.047	(1.76–1.87)
H7	4	2.45 ± 0.092	(2.32–2.52)
H8	4	2.70 ± 0.161	(2.52–2.85)
U1	4	29.75 ± 0.903	(28.90–30.80)
U2	4	6.22 ± 0.251	(5.87–6.46)
R1	4	23.95 ± 0.645	(23.40–24.80)
R2	4	4.48 ± 0.060	(4.44–4.57)
R3	4	2.38 ± 0.071	(2.28–2.44)
R4	4	4.97 ± 0.104	(4.85–5.10)
R5	4	4.24 ± 0.121	(4.09–4.38)
R6	4	2.56 ± 0.061	(2.49–2.64)
R7	4	1.72 ± 0.170	(1.53–1.92)
MC1	4	17.15 ± 0.946	(15.90–18.20)
MC2	4	3.41 ± 0.121	(3.23–3.50)
MC3	4	2.12 ± 0.053	(2.07–2.19)
MC4	4	3.57 ± 0.077	(3.47–3.65)
MC5	4	1.90 ± 0.088	(1.79–1.98)
MC6	4	1.86 ± 0.045	(1.81–1.92)
MC7	4	1.67 ± 0.051	(1.60–1.71)
F1	4	24.92 ± 0.736	(24.00–25.80)
F2	4	7.73 ± 0.156	(7.60–7.88)
F3	4	5.61 ± 0.296	(5.20–5.90)
F4	4	2.65 ± 0.169	(2.49–2.89)
F5	4	5.09 ± 0.069	(5.03–5.19)
F6	4	2.44 ± 0.092	(2.31–2.50)
F7	4	2.42 ± 0.101	(2.29–2.52)
T1	4	27.75 ± 1.001	(26.80–29.00)
T2	4	6.30 ± 0.059	(6.23–6.37)
T3	4	3.88 ± 0.208	(3.66–4.10)
T4	4	3.90 ± 0.151	(3.75–4.11)
T5	4	2.93 ± 0.086	(2.86–3.02)
T6	4	2.44 ± 0.102	(2.34–2.56)
T7	4	1.92 ± 0.036	(1.88–1.96)
MT1	4	20.22 ± 0.750	(19.40–21.00)
MT2	4	2.97 ± 0.071	(2.87–3.02)
MT3	4	2.83 ± 0.361	(2.31–3.12)
MT4	4	3.56 ± 0.112	(3.40–3.66)
MT5	4	1.88 ± 0.047	(1.83–1.93)
MT6	4	1.73 ± 0.032	(1.70–1.76)
MT7	4	1.98 ± 0.086	(1.92–2.10)
S1	2	24.65 ± 1.626	(23.50–25.80)

APPENDIX 2—(*Continued*)

Damaliscus lunatus

H1	3	21.06 ± 0.757	(20.20–21.60)
H2	3	23.10 ± 0.781	(22.20–23.60)
H3	3	5.30 ± 0.105	(5.20–5.41)
H4	3	5.04 ± 0.185	(4.92–5.26)
H5	3	4.92 ± 0.170	(4.76–5.10)
H6	3	2.09 ± 0.075	(2.02–2.17)
H7	3	2.78 ± 0.085	(2.72–2.88)
H8	3	3.28 ± 0.105	(3.18–3.39)
U1	3	37.80 ± 0.916	(36.80–38.60)
U2	3	7.62 ± 0.305	(7.31–7.92)
R1	3	30.56 ± 0.923	(29.50–31.10)
R2	3	5.00 ± 0.199	(4.88–5.23)
R3	3	2.96 ± 0.193	(2.84–3.19)
R4	3	5.64 ± 0.235	(5.48–5.91)
R5	3	4.87 ± 0.159	(4.77–5.06)
R6	3	3.19 ± 0.040	(3.17–3.24)
R7	3	1.95 ± 0.077	(1.87–2.02)
MC1	3	26.63 ± 1.101	(25.50–27.70)
MC2	3	4.06 ± 0.184	(3.86–4.22)
MC3	3	2.56 ± 0.045	(2.51–2.60)
MC4	3	4.06 ± 0.144	(3.94–4.22)
MC5	3	2.33 ± 0.132	(2.23–2.48)
MC6	3	2.36 ± 0.080	(2.28–2.44)
MC7	3	2.04 ± 0.091	(1.96–2.14)
F1	3	27.50 ± 0.781	(26.60–28.00)
F2	3	7.42 ± 0.120	(7.29–7.52)
F3	3	5.29 ± 0.219	(5.05–5.47)
F4	3	3.12 ± 0.112	(3.00–3.22)
F5	3	5.81 ± 0.191	(5.64–6.02)
F6	3	2.62 ± 0.104	(2.55–2.74)
F7	3	2.77 ± 0.096	(2.67–2.86)
T1	3	32.90 ± 1.044	(31.70–33.60)
T2	3	6.97 ± 0.150	(6.80–7.07)
T3	3	4.46 ± 0.258	(4.17–4.66)
T4	3	4.48 ± 0.150	(4.34–4.64)
T5	3	3.29 ± 0.115	(3.17–3.40)
T6	3	2.98 ± 0.106	(2.86–3.05)
T7	3	2.42 ± 0.211	(2.26–2.66)
MT1	3	26.56 ± 0.850	(25.70–27.40)
MT2	3	3.37 ± 0.194	(3.16–3.54)
MT3	3	3.58 ± 0.065	(3.52–3.65)
MT4	3	3.92 ± 0.150	(3.76–4.06)
MT5	3	2.19 ± 0.049	(2.16–2.25)
MT6	3	2.12 ± 0.105	(2.01–2.22)
MT7	3	2.42 ± 0.095	(2.32–2.51)
S1	1	28.40	

Damaliscus korrigum

H1	10	20.29 ± 0.823	(19.20–21.80)
H2	10	22.41 ± 0.980	(21.10–24.20)
H3	10	4.74 ± 0.212	(4.45–5.07)
H4	10	4.73 ± 0.152	(4.50–5.02)
H5	10	4.94 ± 0.261	(4.52–5.42)
H6	10	1.93 ± 0.124	(1.71–2.07)
H7	10	2.55 ± 0.157	(2.32–2.85)
H8	10	3.17 ± 0.155	(2.91–3.41)
U1	10	35.89 ± 1.393	(33.80–37.90)
U2	10	7.22 ± 0.421	(6.59–7.93)
R1	10	28.76 ± 0.974	(27.30–30.20)
R2	10	4.69 ± 0.153	(4.52–5.00)
R3	10	2.71 ± 0.106	(2.56–2.89)
R4	10	5.31 ± 0.198	(5.01–5.69)
R5	10	4.64 ± 0.183	(4.43–5.03)
R6	10	3.00 ± 0.140	(2.82–3.17)
R7	10	1.82 ± 0.121	(1.72–2.14)
MC1	10	24.87 ± 0.754	(23.70–26.20)
MC2	10	3.82 ± 0.091	(3.68–3.95)
MC3	10	2.42 ± 0.060	(2.33–2.53)
MC4	10	3.90 ± 0.139	(3.68–4.13)
MC5	10	2.15 ± 0.112	(2.01–2.36)
MC6	10	2.24 ± 0.081	(2.10–2.37)
MC7	10	1.99 ± 0.106	(1.85–2.23)
F1	10	26.53 ± 0.994	(25.40–28.50)
F2	10	7.59 ± 0.555	(6.92–8.29)
F3	10	5.25 ± 0.235	(4.97–5.58)
F4	10	3.11 ± 0.104	(2.98–3.33)
F5	10	5.67 ± 0.197	(.543–6.05)
F6	10	2.63 ± 0.357	(2.38–3.61)
F7	10	2.69 ± 0.111	(2.56–2.88)
T1	10	31.36 ± 1.447	(29.40–33.80)
T2	10	6.73 ± 0.264	(6.38–7.15)
T3	10	4.48 ± 0.142	(4.30–4.73)
T4	10	4.40 ± 0.202	(4.14–4.81)
T5	10	3.26 ± 0.097	(3.14–3.49)
T6	10	2.85 ± 0.107	(2.74–3.03)
T7	10	2.33 ± 0.134	(2.15–2.59)
MT1	10	24.64 ± 0.865	(23.60–26.60)
MT2	10	3.33 ± 0.081	(3.22–3.45)
MT3	10	3.29 ± 0.126	(3.08–3.54)
MT4	10	3.79 ± 0.152	(3.59–4.05)
MT5	10	2.08 ± 0.106	(1.87–2.28)
MT6	10	2.00 ± 0.069	(1.92–2.11)
MT7	10	2.26 ± 0.109	(2.12–2.49)
S1	6	27.75 ± 1.356	(26.20–29.80)

Damaliscus dorcas

H1	12	16.72 ± 0.601	(15.90–18.06)
H2	12	18.51 ± 0.610	(17.80–19.87)
H3	12	3.82 ± 0.208	(3.48–4.20)
H4	12	3.86 ± 0.112	(3.59–4.05)
H5	12	3.94 ± 0.171	(3.74–4.27)
H6	12	1.57 ± 0.104	(1.42–1.74)
H7	12	1.98 ± 0.158	(1.71–2.23)
H8	12	2.46 ± 0.142	(2.23–2.70)
U1	12	28.62 ± 0.908	(26.57–30.00)
U2	12	5.76 ± 0.201	(5.42–6.13)
R1	12	23.16 ± 0.728	(21.48–24.03)
R2	12	3.84 ± 0.125	(3.54–4.04)
R3	12	2.08 ± 0.131	(1.94–2.37)
R4	12	4.25 ± 0.150	(3.86–4.47)

APPENDIX 2—(*Continued*)

R5	12	3.62 ± 0.121	(3.42–3.84)
R6	12	2.19 ± 0.146	(1.93–2.41)
R7	12	1.31 ± 0.087	(1.18–1.48)
MC1	12	20.73 ± 0.636	(19.76–21.70)
MC2	12	3.01 ± 0.121	(2.87–3.26)
MC3	12	1.96 ± 0.065	(1.89–2.08)
MC4	12	2.93 ± 0.133	(2.72–3.18)
MC5	12	1.78 ± 0.088	(1.61–1.94)
MC6	12	1.67 ± 0.073	(1.54–1.82)
MC7	12	1.51 ± 0.096	(1.35–1.65)
F1	12	22.29 ± 0.789	(20.69–23.50)
F2	12	6.17 ± 0.164	(5.94–6.46)
F3	12	4.33 ± 0.216	(3.98–4.62)
F4	12	2.51 ± 0.120	(2.31–2.73)
F5	12	4.51 ± 0.143	(4.26–4.71)
F6	12	2.12 ± 0.091	(1.96–2.25)
F7	12	2.13 ± 0.090	(2.02–2.27)
T1	12	26.57 ± 1.013	(24.21–27.80)
T2	12	5.34 ± 0.165	(5.05–5.60)
T3	12	3.47 ± 0.131	(3.16–3.67)
T4	12	3.43 ± 0.098	(3.27–3.61)
T5	12	2.66 ± 0.079	(2.56–2.84)
T6	12	2.19 ± 0.098	(2.02–2.35)
T7	12	1.75 ± 0.089	(1.56–1.86)
MT1	12	21.63 ± 0.696	(20.40–22.60)
MT2	12	2.71 ± 0.093	(2.59–2.88)
MT3	12	2.67 ± 0.108	(2.48–2.84)
MT4	12	2.90 ± 0.114	(2.73–3.14)
MT5	12	1.73 ± 0.054	(1.65–1.81)
MT6	12	1.51 ± 0.070	(1.41–1.65)
MT7	12	1.79 ± 0.084	(1.63–1.91)
S1	11	22.83 ± 0.761	(21.47–23.70)

Damaliscus hunteri

H1	5	18.04 ± 0.531	(17.60–18.90)
H2	5	20.30 ± 0.612	(19.70–21.30)
H3	5	4.43 ± 0.057	(4.35–4.50)
H4	5	4.32 ± 0.075	(4.22–4.42)
H5	5	4.38 ± 0.040	(4.34–4.44)
H6	5	1.79 ± 0.054	(1.72–1.85)
H7	5	2.40 ± 0.079	(2.29–2.50)
H8	5	2.87 ± 0.163	(2.59–2.99)
U1	5	33.64 ± 1.110	(32.80–35.50)
U2	5	6.23 ± 0.201	(5.95–6.43)
R1	5	27.52 ± 0.998	(26.60–29.10)
R2	5	4.38 ± 0.091	(4.30–4.50)
R3	5	2.47 ± 0.048	(2.43–2.54)
R4	5	4.92 ± 0.116	(4.73–5.04)
R5	5	4.21 ± 0.105	(4.10–4.38)
R6	5	2.83 ± 0.089	(2.69–2.93)
R7	5	1.61 ± 0.076	(1.52–1.72)
MC1	5	23.88 ± 0.840	(23.10–25.20)
MC2	5	3.44 ± 0.077	(3.34–3.52)
MC3	5	2.12 ± 0.060	(2.05–2.22)
MC4	5	3.29 ± 0.105	(3.11–3.37)
MC5	5	2.06 ± 0.083	(1.95–2.17)
MC6	5	1.96 ± 0.076	(1.85–2.06)
MC7	5	1.77 ± 0.064	(1.68–1.85)
F1	5	25.26 ± 0.782	(24.50–26.50)
F2	5	7.00 ± 0.274	(6.69–7.40)
F3	5	4.92 ± 0.113	(4.79–5.10)
F4	5	3.10 ± 0.040	(3.06–3.15)
F5	5	5.21 ± 0.185	(5.04–5.42)
F6	5	2.51 ± 0.115	(2.40–2.67)
F7	5	2.53 ± 0.195	(2.22–2.75)
T1	5	29.82 ± 1.075	(28.70–31.50)
T2	5	6.35 ± 0.212	(6.15–6.67)
T3	5	4.18 ± 0.220	(4.07–4.58)
T4	5	3.96 ± 0.103	(3.83–4.10)
T5	5	2.86 ± 0.086	(2.77–2.95)
T6	5	2.85 ± 0.106	(2.69–2.98)
T7	5	2.25 ± 0.082	(2.12–2.32)
MT1	5	24.98 ± 0.788	(24.10–26.20)
MT2	5	3.11 ± 0.158	(2.98–3.37)
MT3	5	3.07 ± 0.046	(3.01–3.13)
MT4	5	3.24 ± 0.065	(3.16–3.32)
MT5	5	1.94 ± 0.060	(1.87–2.03)
MT6	5	1.79 ± 0.084	(1.72–1.94)
MT7	5	2.20 ± 0.041	(2.14–2.25)
S1	2	24.45 ± 0.353	(24.20–24.70)

Alcelaphus lichtensteini

H1	1	22.20	MC7	1	2.16
H2	1	24.30	F1	1	29.40
H3	1	5.76	F2	1	8.58
H4	1	5.31	F3	1	6.28
H5	1	5.55	F4	1	3.65
H6	1	2.24	F5	1	6.37
H7	1	2.92	F6	1	2.96
H8	1	3.44	F7	1	2.84
U1	1	39.30	T1	1	34.30
U2	1	7.86	T2	1	7.55
R1	1	32.00	T3	1	4.48
R2	1	5.42	T4	1	4.86
R3	1	3.09	T5	1	3.54
R4	1	6.05	T6	1	3.08
R5	1	5.30	T7	1	2.59
R6	1	3.58	MT1	1	26.30
R7	1	2.24	MT2	1	3.54
MC1	1	26.00	MT3	1	3.69
MC2	1	4.40	MT4	1	4.05
MC3	1	2.66	MT5	1	2.39
MC4	1	4.30	MT6	1	2.36
MC5	1	2.61	MT7	1	2.52
MC6	1	2.62	S1	0	

Connochaetes gnou

H1	4	19.52 ± 0.639	(18.60–20.00)
H2	4	21.37 ± 0.741	(20.40–22.20)
H3	4	4.86 ± 0.268	(4.52–5.16)
H4	4	4.95 ± 0.136	(4.82–5.10)

APPENDIX 2—(*Continued*)

H5	4	5.26 ± 0.333	(4.95–5.69)
H6	4	2.15 ± 0.197	(1.90–2.38)
H7	4	2.73 ± 0.231	(2.48–3.04)
H8	4	3.11 ± 0.164	(2.93–3.32)
U1	4	32.77 ± 1.556	(30.60–34.30)
U2	4	7.55 ± 0.447	(6.95–8.03)
R1	4	25.57 ± 1.291	(23.70–26.60)
R2	4	5.15 ± 0.178	(4.97–5.32)
R3	4	2.67 ± 0.145	(2.49–2.84)
R4	4	5.82 ± 0.260	(5.54–6.07)
R5	4	4.84 ± 0.192	(4.72–5.13)
R6	4	2.83 ± 0.235	(2.70–3.19)
R7	4	1.80 ± 0.120	(1.68–1.92)
MC1	4	19.35 ± 0.500	(18.80–20.00)
MC2	4	3.95 ± 0.201	(3.79–4.24)
MC3	4	2.46 ± 0.112	(2.37–2.63)
MC4	4	3.94 ± 0.226	(3.71–4.23)
MC5	4	1.97 ± 0.126	(1.79–2.07)
MC6	4	2.15 ± 0.094	(2.05–2.27)
MC7	4	1.80 ± 0.146	(1.60–1.92)
F1	4	24.97 ± 0.718	(23.90–25.40)
F2	4	7.96 ± 0.365	(7.55–8.40)
F3	4	5.11 ± 0.259	(4.86–5.42)
F4	4	3.14 ± 0.119	(3.01–3.30)
F5	4	5.85 ± 0.229	(5.64–6.17)
F6	4	2.57 ± 0.168	(2.43–2.81)
F7	4	2.85 ± 0.135	(2.70–3.03)
T1	4	29.25 ± 1.386	(27.20–30.10)
T2	4	7.07 ± 0.449	(6.53–7.57)
T3	4	4.38 ± 0.164	(4.23–4.57)
T4	4	4.45 ± 0.213	(4.26–4.72)
T5	4	3.39 ± 0.313	(3.08–3.83)
T6	4	2.81 ± 0.127	(2.72–3.00)
T7	4	2.15 ± 0.050	(2.09–2.21)
MT1	4	21.40 ± 0.559	(20.60–21.90)
MT2	4	3.51 ± 0.202	(3.33–3.71)
MT3	4	3.28 ± 0.162	(3.14–3.51)
MT4	4	3.67 ± 0.147	(3.54–3.82)
MT5	4	1.96 ± 0.094	(1.88–2.10)
MT6	4	1.97 ± 0.084	(1.92–2.10)
MT7	4	2.09 ± 0.095	(2.00–2.21)
S1	2	28.25 ± 1.909	(26.90–29.60)

Connochaetes taurinus

H1	19	22.19 ± 1.006	(19.90–23.50)
H2	19	24.26 ± 1.202	(21.10–26.00)
H3	19	5.81 ± 0.381	(5.06–6.37)
H4	19	5.76 ± 0.260	(5.22–6.27)
H5	19	5.88 ± 0.294	(5.20–6.28)
H6	19	2.10 ± 0.182	(1.72–2.55)
H7	19	3.19 ± 0.232	(2.72–3.64)
H8	19	3.79 ± 0.304	(3.16–4.39)
U1	19	37.96 ± 2.062	(33.60–40.90)
U2	19	8.78 ± 0.732	(7.27–10.01)
R1	19	30.07 ± 1.744	(26.60–32.60)
R2	19	5.78 ± 0.244	(5.35–6.21)
R3	19	3.16 ± 0.183	(2.78–3.45)
R4	19	6.68 ± 0.354	(6.01–7.16)
R5	19	5.77 ± 0.364	(5.08–6.48)
R6	19	3.51 ± 0.297	(3.05–4.10)
R7	19	2.16 ± 0.196	(1.81–2.54)
MC1	19	22.15 ± 0.905	(20.50–23.90)
MC2	19	4.59 ± 0.210	(4.12–4.90)
MC3	19	2.70 ± 0.141	(2.37–2.95)
MC4	19	4.69 ± 0.250	(4.24–5.11)
MC5	19	2.29 ± 0.149	(1.97–2.54)
MC6	19	2.64 ± 0.190	(2.32–2.97)
MC7	19	2.11 ± 0.173	(1.66–2.34)
F1	19	28.68 ± 1.525	(25.00–30.60)
F2	19	9.09 ± 0.597	(7.90–10.11)
F3	19	6.01 ± 0.502	(5.22–7.18)
F4	19	3.63 ± 0.212	(3.29–3.91)
F5	19	6.74 ± 0.292	(5.99–7.20)
F6	19	3.02 ± 0.186	(2.70–3.37)
F7	19	3.34 ± 0.267	(2.76–4.03)
T1	19	32.66 ± 1.873	(28.10–35.50)
T2	19	8.08 ± 0.334	(7.25–8.55)
T3	19	4.89 ± 0.271	(4.20–5.24)
T4	19	5.11 ± 0.288	(4.50–5.48)
T5	19	3.82 ± 0.340	(3.48–5.10)
T6	19	3.33 ± 0.243	(2.81–3.74)
T7	19	2.79 ± 0.267	(2.35–3.48)
MT1	19	23.62 ± 1.021	(21.70–25.80)
MT2	19	3.88 ± 0.188	(3.47–4.21)
MT3	19	3.70 ± 0.171	(3.43–4.00)
MT4	19	4.43 ± 0.198	(4.01–4.76)
MT5	19	2.24 ± 0.107	(2.00–2.42)
MT6	19	2.37 ± 0.176	(2.08–2.65)
MT7	19	2.54 ± 0.189	(2.08–2.80)
S1	11	34.07 ± 2.021	(30.60–37.30)

Oreotragus oreotragus

H1	9	11.62 ± 0.406	(10.77–12.26)
H2	9	12.96 ± 0.421	(12.08–13.65)
H3	9	2.11 ± 0.161	(1.84–2.38)
H4	9	2.04 ± 0.092	(1.88–2.18)
H5	9	2.11 ± 0.107	(1.98–2.31)
H6	9	0.81 ± 0.060	(0.71–0.91)
H7	9	1.04 ± 0.063	(0.96–1.14)
H8	9	1.39 ± 0.076	(1.27–1.49)
U1	9	13.88 ± 0.484	(13.20–14.70)
U2	9	2.78 ± 0.146	(2.60–3.08)
R1	9	10.71 ± 0.386	(10.02–11.24)
R2	9	1.99 ± 0.094	(1.81–2.15)
R3	9	1.09 ± 0.057	(0.98–1.16)
R4	9	2.02 ± 0.074	(1.91–2.14)
R5	9	1.96 ± 0.097	(1.82–2.09)
R6	9	1.23 ± 0.059	(1.14–1.30)
R7	9	0.79 ± 0.053	(0.73–0.88)
MC1	9	9.12 ± 0.341	(8.52–9.57)
MC2	9	1.73 ± 0.081	(1.63–1.90)
MC3	9	1.06 ± 0.056	(0.98–1.15)

APPENDIX 2—(*Continued*)

MC4	9	1.78 ± 0.085	(1.61–1.89)
MC5	9	0.94 ± 0.083	(0.83–1.08)
MC6	9	1.20 ± 0.063	(1.09–1.29)
MC7	9	0.82 ± 0.046	(0.73–0.88)
F1	9	15.04 ± 0.650	(14.13–15.77)
F2	9	3.38 ± 0.241	(3.09–3.65)
F3	9	2.83 ± 0.300	(2.42–3.27)
F4	9	1.32 ± 0.061	(1.26–1.44)
F5	9	2.72 ± 0.190	(2.48–3.03)
F6	9	1.27 ± 0.182	(1.11–1.73)
F7	9	1.34 ± 0.206	(1.19–1.88)
T1	9	16.94 ± 0.681	(16.08–17.84)
T2	9	2.98 ± 0.359	(2.09–3.37)
T3	9	1.97 ± 0.126	(1.81–2.20)
T4	9	2.02 ± 0.075	(1.95–2.20)
T5	9	1.50 ± 0.083	(1.34–1.61)
T6	9	1.24 ± 0.076	(1.13–1.40)
T7	9	1.21 ± 0.035	(1.15–1.27)
MT1	9	9.54 ± 0.351	(9.03–10.04)
MT2	9	1.57 ± 0.092	(1.43–1.70)
MT3	9	1.48 ± 0.096	(1.33–1.61)
MT4	9	1.78 ± 0.075	(1.68–1.90)
MT5	9	1.07 ± 0.059	(1.00–1.18)
MT6	9	1.13 ± 0.175	(1.02–1.59)
MT7	9	0.98 ± 0.029	(0.95–1.04)
S1	7	10.52 ± 0.427	(9.88–11.07)

Ourebia ourebi

H1	10	10.48 ± 0.598	(9.60–11.47)
H2	10	11.59 ± 0.673	(10.78–12.61)
H3	10	2.20 ± 0.151	(2.03–2.51)
H4	10	2.06 ± 0.124	(1.89–2.27)
H5	10	2.37 ± 0.154	(2.10–2.56)
H6	10	0.96 ± 0.082	(0.83–1.09)
H7	10	1.10 ± 0.105	(0.97–1.31)
H8	10	1.28 ± 0.105	(1.15–1.47)
U1	10	16.35 ± 1.121	(14.30–17.95)
U2	10	2.97 ± 0.266	(2.59–3.34)
R1	10	13.34 ± 0.846	(11.70–14.64)
R2	10	2.02 ± 0.131	(1.84–2.25)
R3	10	1.22 ± 0.098	(1.10–1.38)
R4	10	2.14 ± 0.161	(1.89–2.41)
R5	10	2.01 ± 0.121	(1.85–2.22)
R6	10	1.34 ± 0.105	(1.20–1.47)
R7	10	0.79 ± 0.053	(0.73–0.88)
MC1	10	15.47 ± 1.120	(13.70–17.50)
MC2	10	1.78 ± 0.133	(1.55–1.93)
MC3	10	1.17 ± 0.090	(1.05–1.31)
MC4	10	1.61 ± 0.133	(1.42–1.80)
MC5	10	1.02 ± 0.071	(0.90–1.12)
MC6	10	1.06 ± 0.070	(0.97–1.15)
MC7	10	0.91 ± 0.069	(0.82–1.01)
F1	10	15.79 ± 0.860	(14.50–16.93)
F2	10	3.73 ± 0.232	(3.40–4.11)
F3	10	2.87 ± 0.200	(2.65–3.21)
F4	10	1.65 ± 0.106	(1.53–1.81)
F5	10	3.01 ± 0.182	(2.72–3.28)
F6	10	1.41 ± 0.118	(1.24–1.56)
F7	10	1.39 ± 0.124	(1.24–1.60)
T1	10	19.22 ± 0.938	(17.90–21.29)
T2	10	3.52 ± 0.181	(3.27–3.79)
T3	10	2.64 ± 0.157	(2.39–2.86)
T4	10	2.26 ± 0.172	(1.99–2.47)
T5	10	1.71 ± 0.087	(1.58–1.84)
T6	10	1.47 ± 0.121	(1.32–1.64)
T7	10	1.33 ± 0.089	(1.22–1.52)
MT1	10	15.11 ± 1.020	(13.60–17.00)
MT2	10	1.82 ± 0.125	(1.60–1.97)
MT3	10	1.85 ± 0.127	(1.59–2.00)
MT4	10	1.92 ± 0.154	(1.68–2.18)
MT5	10	1.16 ± 0.078	(1.06–1.29)
MT6	10	1.10 ± 0.073	(1.00–1.19)
MT7	10	1.23 ± 0.090	(1.08–1.34)
S1	6	11.00 ± 0.740	(10.14–12.00)

Raphicerus campestris

H1	9	9.29 ± 0.286	(8.82–9.86)
H2	9	10.07 ± 0.334	(9.60–10.76)
H3	9	1.84 ± 0.064	(1.78–1.99)
H4	9	1.65 ± 0.059	(1.57–1.73)
H5	9	1.92 ± 0.104	(1.73–2.12)
H6	9	0.75 ± 0.080	(0.64–0.91)
H7	9	0.89 ± 0.042	(0.83–0.97)
H8	9	1.07 ± 0.055	(0.99–1.18)
U1	9	13.77 ± 0.543	(12.91–14.40)
U2	9	2.50 ± 0.074	(2.40–2.64)
R1	9	11.19 ± 0.350	(10.67–11.64)
R2	9	1.64 ± 0.102	(1.47–1.83)
R3	9	1.03 ± 0.035	(0.98–1.09)
R4	9	1.72 ± 0.093	(1.58–1.88)
R5	9	1.62 ± 0.056	(1.56–1.72)
R6	9	1.08 ± 0.034	(1.04–1.15)
R7	9	0.63 ± 0.045	(0.54–0.71)
MC1	9	12.08 ± 0.446	(11.37–12.70)
MC2	9	1.44 ± 0.082	(1.36–1.61)
MC3	9	0.92 ± 0.068	(0.83–1.06)
MC4	9	1.25 ± 0.056	(1.18–1.37)
MC5	9	0.85 ± 0.036	(0.81–0.93)
MC6	9	0.87 ± 0.030	(0.82–0.92)
MC7	9	0.74 ± 0.046	(0.67–0.82)
F1	9	13.53 ± 0.542	(12.79–14.30)
F2	9	3.10 ± 0.121	(2.94–3.34)
F3	9	2.35 ± 0.124	(2.15–2.56)
F4	9	1.35 ± 0.111	(1.22–1.58)
F5	9	2.40 ± 0.444	(1.31–2.89)
F6	9	1.19 ± 0.082	(1.08–1.31)
F7	9	1.15 ± 0.077	(1.04–1.28)
T1	9	17.13 ± 0.554	(16.02–17.90)
T2	9	3.00 ± 0.131	(2.87–3.27)
T3	9	2.27 ± 0.176	(2.00–2.54)
T4	9	1.93 ± 0.082	(1.77–2.03)
T5	9	1.47 ± 0.072	(1.33–1.60)

APPENDIX 2—(*Continued*)

T6	9	1.26 ± 0.057	(1.19–1.37)
T7	9	1.09 ± 0.053	(0.98–1.16)
MT1	9	12.81 ± 0.537	(11.98–13.80)
MT2	9	1.52 ± 0.060	(1.45–1.65)
MT3	9	1.54 ± 0.056	(1.46–1.62)
MT4	9	1.66 ± 0.070	(1.58–1.80)
MT5	9	1.07 ± 0.042	(1.02–1.17)
MT6	9	0.95 ± 0.048	(0.87–1.02)
MT7	9	1.05 ± 0.069	(0.94–1.16)
S1	8	9.07 ± 0.235	(8.79–9.51)

Neotragus moschatus

H1	5	7.69 ± 0.250	(7.33–7.95)
H2	5	8.39 ± 0.278	(7.98–8.64)
H3	5	1.28 ± 0.081	(1.18–1.40)
H4	5	1.25 ± 0.075	(1.20–1.38)
H5	5	1.40 ± 0.114	(1.28–1.58)
H6	5	0.53 ± 0.061	(0.46–0.60)
H7	5	0.67 ± 0.031	(0.63–0.71)
H8	5	0.83 ± 0.045	(0.76–0.88)
U1	5	9.54 ± 0.386	(9.09–10.15)
U2	5	1.73 ± 0.116	(1.55–1.84)
R1	5	7.73 ± 0.305	(7.35–8.20)
R2	5	1.26 ± 0.055	(1.22–1.36)
R3	5	0.68 ± 0.048	(0.63–0.75)
R4	5	1.35 ± 0.073	(1.30–1.48)
R5	5	1.12 ± 0.036	(1.09–1.18)
R6	5	0.80 ± 0.028	(0.75–0.82)
R7	5	0.46 ± 0.016	(0.44–0.48)
MC1	5	6.89 ± 0.770	(6.38–8.16)
MC2	5	0.98 ± 0.052	(0.92–1.05)
MC3	5	0.65 ± 0.033	(0.62–0.70)
MC4	5	0.89 ± 0.058	(0.83–0.97)
MC5	5	0.59 ± 0.042	(0.55–0.66)
MC6	5	0.60 ± 0.014	(0.58–0.62)
MC7	5	0.47 ± 0.024	(0.44–0.51)
F1	5	10.39 ± 0.408	(9.87–10.80)
F2	5	2.22 ± 0.081	(2.14–2.32)
F3	5	1.90 ± 0.125	(1.73–2.05)
F4	5	0.89 ± 0.032	(0.87–0.94)
F5	5	1.69 ± 0.075	(1.60–1.80)
F6	5	0.84 ± 0.070	(0.75–0.92)
F7	5	0.83 ± 0.057	(0.77–0.90)
T1	5	12.27 ± 0.428	(11.73–12.70)
T2	5	2.04 ± 0.069	(1.98–2.16)
T3	5	1.42 ± 0.053	(1.34–1.48)
T4	5	1.32 ± 0.060	(1.25–1.41)
T5	5	0.96 ± 0.071	(0.90–1.08)
T6	5	0.87 ± 0.027	(0.84–0.90)
T7	5	0.76 ± 0.051	(0.70–0.84)
MT1	5	9.07 ± 0.677	(8.62–10.26)
MT2	5	0.96 ± 0.029	(0.92–1.00)
MT3	5	1.02 ± 0.073	(0.92–1.11)
MT4	5	0.99 ± 0.066	(0.91–1.08)
MT5	5	0.67 ± 0.033	(0.63–0.72)
MT6	5	0.64 ± 0.015	(0.63–0.66)
MT7	5	0.63 ± 0.056	(0.58–0.73)
S1	4	7.18 ± 0.269	(6.82–7.42)

Neotragus pygmaeus

H1	1	6.64	MC7	1	0.36
H2	1	7.03	F1	1	8.73
H3	1	1.00	F2	1	1.78
H4	1	0.94	F3	1	1.66
H5	1	1.05	F4	1	0.78
H6	1	0.40	F5	1	1.42
H7	1	0.54	F6	1	0.71
H8	1	0.69	F7	1	0.71
U1	1	7.70	T1	1	10.22
U2	1	1.42	T2	1	1.67
R1	1	6.29	T3	1	1.21
R2	1	0.93	T4	1	1.06
R3	1	0.51	T5	1	0.82
R4	1	0.96	T6	1	0.74
R5	1	0.88	T7	1	0.58
R6	1	0.66	MT1	1	7.84
R7	1	0.37	MT2	1	0.78
MC1	1	5.64	MT3	1	0.72
MC2	1	0.74	MT4	1	0.83
MC3	1	0.54	MT5	1	0.59
MC4	1	0.69	MT6	1	0.54
MC5	1	0.46	MT7	1	0.51
MC6	1	0.49	S1	0	

Neotragus batesi

H1	5	7.49 ± 0.081	(7.38–7.57)
H2	5	8.02 ± 0.099	(7.86–8.10)
H3	5	1.05 ± 0.047	(1.00–1.11)
H4	5	1.00 ± 0.013	(0.99–1.02)
H5	5	1.17 ± 0.038	(1.12–1.22)
H6	5	0.45 ± 0.038	(0.41–0.50)
H7	5	0.55 ± 0.020	(0.53–0.58)
H8	5	0.72 ± 0.064	(0.64–0.79)
U1	5	9.02 ± 0.200	(8.80–9.18)
U2	5	1.40 ± 0.065	(1.32–1.49)
R1	5	7.48 ± 0.208	(7.19–7.65)
R2	5	0.99 ± 0.027	(0.95–1.02)
R3	5	0.54 ± 0.037	(0.51–0.60)
R4	5	1.03 ± 0.046	(0.97–1.08)
R5	5	0.93 ± 0.035	(0.89–0.98)
R6	5	0.64 ± 0.036	(0.60–0.69)
R7	5	0.42 ± 0.032	(0.37–0.45)
MC1	5	7.03 ± 0.333	(6.61–7.37)
MC2	5	0.85 ± 0.030	(0.80–0.88)
MC3	5	0.57 ± 0.019	(0.56–0.61)
MC4	5	0.75 ± 0.024	(0.72–0.78)
MC5	5	0.47 ± 0.025	(0.44–0.50)
MC6	5	0.50 ± 0.035	(0.47–0.56)
MC7	5	0.40 ± 0.025	(0.38–0.43)
F1	5	9.51 ± 0.117	(9.34–9.67)
F2	5	1.91 ± 0.180	(1.68–2.14)

APPENDIX 2—(*Continued*)

F3	5	1.70 ± 0.053	(1.65–1.79)
F4	5	0.80 ± 0.025	(0.76–0.83)
F5	5	1.52 ± 0.042	(1.46–1.57)
F6	5	0.72 ± 0.044	(0.67–0.79)
F7	5	0.71 ± 0.033	(0.67–0.75)
T1	5	11.79 ± 0.335	(11.43–12.28)
T2	5	1.79 ± 0.042	(1.76–1.87)
T3	5	1.16 ± 0.077	(1.06–1.26)
T4	5	1.12 ± 0.049	(1.06–1.18)
T5	5	0.85 ± 0.018	(0.83–0.88)
T6	5	0.72 ± 0.040	(0.67–0.78)
T7	5	0.65 ± 0.049	(0.58–0.72)
MT1	5	9.73 ± 0.299	(9.33–10.03)
MT2	5	0.79 ± 0.021	(0.77–0.83)
MT3	5	0.83 ± 0.052	(0.77–0.91)
MT4	5	0.84 ± 0.025	(0.81–0.87)
MT5	5	0.58 ± 0.036	(0.52–0.61)
MT6	5	0.57 ± 0.042	(0.53–0.62)
MT7	5	0.53 ± 0.019	(0.50–0.55)
S1	3	5.88 ± 0.222	(5.74–6.14)
Madoqua phillipsi			
H1	3	7.03 ± 0.384	(6.60–7.34)
H2	3	7.76 ± 0.367	(7.36–8.08)
H3	3	1.22 ± 0.060	(1.15–1.26)
H4	3	1.06 ± 0.064	(1.02–1.14)
H5	3	1.19 ± 0.046	(1.17–1.25)
H6	3	0.48 ± 0.049	(0.45–0.54)
H7	3	0.57 ± 0.047	(0.54–0.63)
H8	3	0.72 ± 0.061	(0.67–0.79)
U1	3	10.38 ± 0.329	(10.00–10.58)
U2	3	1.69 ± 0.035	(1.66–1.73)
R1	3	8.51 ± 0.265	(8.22–8.73)
R2	3	1.05 ± 0.057	(1.02–1.12)
R3	3	0.59 ± 0.070	(0.52–0.66)
R4	3	1.10 ± 0.064	(1.06–1.18)
R5	3	1.05 ± 0.097	(0.97–1.16)
R6	3	0.69 ± 0.046	(0.67–0.75)
R7	3	0.44 ± 0.015	(0.43–0.46)
MC1	3	8.56 ± 0.732	(7.90–9.35)
MC2	3	0.92 ± 0.080	(0.85–1.01)
MC3	3	0.59 ± 0.079	(0.53–0.68)
MC4	3	0.83 ± 0.023	(0.82–0.86)
MC5	3	0.53 ± 0.045	(0.49–0.58)
MC6	3	0.56 ± 0.030	(0.53–0.59)
MC7	3	0.48 ± 0.049	(0.45–0.54)
F1	3	9.41 ± 0.459	(9.00–9.91)
F2	3	1.86 ± 0.245	(1.61–2.10)
F3	3	1.53 ± 0.055	(1.48–1.59)
F4	3	0.83 ± 0.047	(0.80–0.89)
F5	3	1.68 ± 0.110	(1.57–1.79)
F6	3	0.76 ± 0.010	(0.75–0.77)
F7	3	0.73 ± 0.064	(0.69–0.81)
T1	3	12.96 ± 0.305	(12.70–13.30)
T2	3	1.92 ± 0.030	(1.90–1.96)
T3	3	1.48 ± 0.070	(1.43–1.56)
T4	3	1.16 ± 0.106	(1.10–1.29)
T5	3	0.94 ± 0.087	(0.88–1.04)
T6	3	0.77 ± 0.041	(0.74–0.82)
T7	3	0.76 ± 0.025	(0.74–0.79)
MT1	3	9.95 ± 0.665	(9.37–10.68)
MT2	3	0.95 ± 0.073	(0.90–1.04)
MT3	3	1.00 ± 0.045	(0.96–1.05)
MT4	3	1.00 ± 0.064	(0.96–1.08)
MT5	3	0.62 ± 0.080	(0.58–0.72)
MT6	3	0.58 ± 0.020	(0.56–0.60)
MT7	3	0.67 ± 0.065	(0.60–0.73)
S1	0		
Madoqua saltiana			
H1	2	7.98 ± 0.190	(7.85–8.12)
H2	2	8.67 ± 0.289	(8.47–8.88)
H3	2	1.40 ± 0.063	(1.36–1.45)
H4	2	1.25 ± 0.028	(1.23–1.27)
H5	2	1.42 ± 0.084	(1.36–1.48)
H6	2	0.53 ± 0.035	(0.51–0.56)
H7	2	0.65 ± 0.021	(0.64–0.67)
H8	2	0.73 ± 0.035	(0.71–0.76)
U1	2	10.90 ± 0.459	(10.58–11.23)
U2	2	1.90 ± 0.205	(1.76–2.05)
R1	2	8.91 ± 0.261	(8.73–9.10)
R2	2	1.23 ± 0.077	(1.18–1.29)
R3	2	0.71 ± 0.035	(0.69–0.74)
R4	2	1.25 ± 0.042	(1.22–1.28)
R5	2	1.15 ± 0.000	(1.15–1.15)
R6	2	0.75 ± 0.035	(0.73–0.78)
R7	2	0.48 ± 0.035	(0.46–0.51)
MC1	2	8.18 ± 0.169	(8.06–8.30)
MC2	2	1.01 ± 0.007	(1.01–1.02)
MC3	2	0.66 ± 0.007	(0.66–0.67)
MC4	2	0.98 ± 0.035	(0.96–1.01)
MC5	2	0.54 ± 0.035	(0.52–0.57)
MC6	2	0.66 ± 0.000	(0.66–0.66)
MC7	2	0.49 ± 0.007	(0.49–0.50)
F1	2	10.26 ± 0.042	(10.23–10.29)
F2	2	2.02 ± 0.106	(1.95–2.10)
F3	2	1.64 ± 0.028	(1.62–1.66)
F4	2	0.97 ± 0.007	(0.97–0.98)
F5	2	1.89 ± 0.070	(1.84–1.94)
F6	2	0.82 ± 0.014	(0.81–0.83)
F7	2	0.80 ± 0.014	(0.79–0.81)
T1	2	13.50 ± 0.424	(13.20–13.80)
T2	2	2.16 ± 0.120	(2.08–2.25)
T3	2	1.68 ± 0.169	(1.56–1.80)
T4	2	1.27 ± 0.035	(1.25–1.30)
T5	2	1.03 ± 0.021	(1.02–1.05)
T6	2	0.87 ± 0.056	(0.83–0.91)
T7	2	0.80 ± 0.007	(0.80–0.81)
MT1	2	9.76 ± 0.035	(9.74–9.79)
MT2	2	1.03 ± 0.028	(1.01–1.05)
MT3	2	1.09 ± 0.014	(1.08–1.10)
MT4	2	1.13 ± 0.007	(1.13–1.14)

APPENDIX 2—(*Continued*)

MT5	2	0.67 ± 0.035	(0.65–0.70)
MT6	2	0.70 ± 0.028	(0.68–0.72)
MT7	2	0.67 ± 0.000	(0.67–0.67)
S1	0		

Madoqua guentheri

H1	3	8.06 ± 0.230	(7.80–8.20)
H2	3	8.83 ± 0.288	(8.50–9.00)
H3	3	1.34 ± 0.040	(1.30–1.38)
H4	3	1.25 ± 0.036	(1.21–1.28)
H5	3	1.38 ± 0.068	(1.31–1.44)
H6	3	0.57 ± 0.034	(0.55–0.61)
H7	3	0.70 ± 0.035	(0.67–0.74)
H8	3	0.84 ± 0.015	(0.83–0.86)
U1	3	11.60 ± 0.519	(11.00–11.90)
U2	3	1.88 ± 0.045	(1.83–1.92)
R1	3	9.43 ± 0.461	(8.90–9.70)
R2	3	1.21 ± 0.026	(1.18–1.23)
R3	3	0.73 ± 0.030	(0.71–0.77)
R4	3	1.32 ± 0.030	(1.30–1.36)
R5	3	1.22 ± 0.040	(1.19–1.27)
R6	3	0.81 ± 0.030	(0.78–0.84)
R7	3	0.50 ± 0.055	(0.44–0.55)
MC1	3	9.53 ± 0.404	(9.10–9.90)
MC2	3	1.06 ± 0.015	(1.05–1.08)
MC3	3	0.75 ± 0.037	(0.73–0.80)
MC4	3	0.94 ± 0.026	(0.92–0.97)
MC5	3	0.61 ± 0.035	(0.58–0.65)
MC6	3	0.63 ± 0.026	(0.61–0.66)
MC7	3	0.54 ± 0.025	(0.52–0.57)
F1	3	10.76 ± 0.416	(10.30–11.10)
F2	3	2.53 ± 0.153	(2.44–2.71)
F3	3	1.93 ± 0.156	(1.76–2.06)
F4	3	0.91 ± 0.020	(0.90–0.94)
F5	3	1.82 ± 0.066	(1.77–1.90)
F6	3	0.86 ± 0.072	(0.78–0.92)
F7	3	0.83 ± 0.052	(0.77–0.87)
T1	3	14.13 ± 0.568	(13.50–14.60)
T2	3	2.16 ± 0.085	(2.10–2.26)
T3	3	1.65 ± 0.115	(1.55–1.78)
T4	3	1.32 ± 0.017	(1.30–1.33)
T5	3	1.01 ± 0.040	(0.98–1.06)
T6	3	0.89 ± 0.045	(0.84–0.93)
T7	3	0.85 ± 0.055	(0.80–0.91)
MT1	3	10.60 ± 0.435	(10.10–10.90)
MT2	3	1.04 ± 0.030	(1.01–1.07)
MT3	3	1.10 ± 0.030	(1.08–1.14)
MT4	3	1.09 ± 0.040	(1.05–1.13)
MT5	3	0.74 ± 0.015	(0.73–0.76)
MT6	3	0.65 ± 0.049	(0.62–0.71)
MT7	3	0.72 ± 0.026	(0.70–0.75)
S1	3	6.97 ± 0.447	(6.50–7.39)

Madoqua kirki

H1	8	8.25 ± 0.563	(7.36–8.78)
H2	8	9.09 ± 0.608	(8.18–9.68)
H3	8	1.44 ± 0.127	(1.25–1.60)
H4	8	1.33 ± 0.100	(1.17–1.44)
H5	8	1.48 ± 0.105	(1.33–1.59)
H6	8	0.63 ± 0.038	(0.56–0.69)
H7	8	0.69 ± 0.076	(0.58–0.80)
H8	8	0.89 ± 0.092	(0.78–1.05)
U1	8	11.34 ± 0.607	(10.48–12.04)
U2	8	1.90 ± 0.135	(1.69–2.14)
R1	8	9.21 ± 0.535	(8.47–9.88)
R2	8	1.33 ± 0.101	(1.20–1.47)
R3	8	0.78 ± 0.026	(0.73–0.82)
R4	8	1.40 ± 0.099	(1.23–1.55)
R5	8	1.26 ± 0.067	(1.15–1.34)
R6	8	0.82 ± 0.077	(0.72–0.92)
R7	8	0.53 ± 0.061	(0.43–0.61)
MC1	8	9.26 ± 0.401	(8.82–9.95)
MC2	8	1.11 ± 0.057	(1.02–1.20)
MC3	8	0.76 ± 0.051	(0.68–0.85)
MC4	8	0.96 ± 0.085	(0.79–1.08)
MC5	8	0.60 ± 0.054	(0.55–0.71)
MC6	8	0.66 ± 0.045	(0.61–0.72)
MC7	8	0.55 ± 0.037	(0.50–0.62)
F1	8	10.93 ± 0.583	(10.25–11.82)
F2	8	2.43 ± 0.102	(2.26–2.56)
F3	8	1.84 ± 0.129	(1.70–2.11)
F4	8	1.00 ± 0.094	(0.85–1.14)
F5	8	1.94 ± 0.129	(1.75–2.09)
F6	8	0.90 ± 0.077	(0.81–1.01)
F7	8	0.85 ± 0.080	(0.75–1.00)
T1	8	14.07 ± 0.601	(13.32–14.81)
T2	8	2.25 ± 0.134	(2.02–2.40)
T3	8	1.75 ± 0.133	(1.52–1.92)
T4	8	1.43 ± 0.069	(1.31–1.52)
T5	8	1.07 ± 0.058	(0.98–1.16)
T6	8	0.94 ± 0.099	(0.83–1.07)
T7	8	0.88 ± 0.082	(0.76–1.03)
MT1	8	10.07 ± 0.645	(8.76–10.82)
MT2	8	1.10 ± 0.080	(0.97–1.20)
MT3	8	1.13 ± 0.061	(1.04–1.21)
MT4	8	1.11 ± 0.083	(0.98–1.22)
MT5	8	0.71 ± 0.065	(0.62–0.83)
MT6	8	0.70 ± 0.063	(0.62–0.78)
MT7	8	0.73 ± 0.073	(0.61–0.84)
S1	5	7.07 ± 0.427	(6.54–7.63)

Dorcatragus megalotis

H1	1	11.00	MC7	1	0.78
H2	1	12.30	F1	1	14.40
H3	1	1.99	F2	1	3.12
H4	1	1.90	F3	1	2.48
H5	1	2.05	F4	1	1.25
H6	1	0.85	F5	1	2.50
H7	1	0.97	F6	1	1.23
H8	1	1.17	F7	1	1.12
U1	1	17.20	T1	1	19.30

APPENDIX 2—(*Continued*)

U2	1	3.16	T2	1	2.83
R1	1	13.90	T3	1	2.20
R2	1	1.76	T4	1	1.90
R3	1	1.04	T5	1	1.34
R4	1	1.81	T6	1	1.33
R5	1	1.82	T7	1	1.02
R6	1	1.11	MT1	1	14.00
R7	1	0.67	MT2	1	1.35
MC1	1	13.10	MT3	1	1.56
MC2	1	1.54	MT4	1	1.50
MC3	1	1.07	MT5	1	0.91
MC4	1	1.45	MT6	1	1.00
MC5	1	0.84	MT7	1	0.97
MC6	1	1.04	S1	0	

Antilope cervicapra

H1	4	12.77 ± 0.826	(11.70–13.60)
H2	4	14.37 ± 0.846	(13.30–15.30)
H3	4	2.92 ± 0.184	(2.72–3.16)
H4	4	2.80 ± 0.205	(2.50–2.96)
H5	4	3.09 ± 0.168	(2.86–3.24)
H6	4	1.24 ± 0.130	(1.07–1.37)
H7	4	1.44 ± 0.203	(1.26–1.69)
H8	4	1.69 ± 0.241	(1.51–2.04)
U1	4	20.52 ± 1.438	(18.80–22.30)
U2	4	3.97 ± 0.278	(3.71–4.35)
R1	4	16.47 ± 1.144	(15.10–17.90)
R2	4	2.75 ± 0.152	(2.61–2.93)
R3	4	1.66 ± 0.148	(1.50–1.86)
R4	4	3.06 ± 0.186	(2.83–3.26)
R5	4	2.70 ± 0.207	(2.50–2.91)
R6	4	1.70 ± 0.256	(1.42–2.02)
R7	4	1.02 ± 0.106	(0.90–1.14)
MC1	4	17.80 ± 0.828	(16.80–18.70)
MC2	4	2.24 ± 0.223	(2.06–2.51)
MC3	4	1.50 ± 0.101	(1.41–1.64)
MC4	4	2.08 ± 0.219	(1.90–2.36)
MC5	4	1.27 ± 0.088	(1.21–1.40)
MC6	4	1.34 ± 0.134	(1.22–1.48)
MC7	4	1.17 ± 0.110	(1.06–1.30)
F1	4	17.62 ± 1.212	(16.10–19.00)
F2	4	4.51 ± 0.397	(4.10–4.88)
F3	4	3.41 ± 0.385	(3.08–3.86)
F4	4	2.00 ± 0.088	(1.88–2.08)
F5	4	3.60 ± 0.237	(3.34–3.90)
F6	4	1.59 ± 0.198	(1.42–1.85)
F7	4	1.60 ± 0.160	(1.41–1.80)
T1	4	21.72 ± 1.475	(19.90–23.50)
T2	4	4.19 ± 0.184	(4.02–4.43)
T3	4	2.92 ± 0.283	(2.50–3.09)
T4	4	2.57 ± 0.191	(2.40–2.83)
T5	4	2.05 ± 0.099	(1.96–2.18)
T6	4	1.75 ± 0.187	(1.52–1.97)
T7	4	1.55 ± 0.081	(1.45–1.65)
MT1	4	17.87 ± 0.963	(16.60–18.80)
MT2	4	2.03 ± 0.118	(1.93–2.18)
MT3	4	2.23 ± 0.189	(2.01–2.43)
MT4	4	2.22 ± 0.183	(2.05–2.44)
MT5	4	1.41 ± 0.100	(1.35–1.56)
MT6	4	1.22 ± 0.098	(1.14–1.34)
MT7	4	1.41 ± 0.104	(1.30–1.55)
S1	1	15.50	

Aepyceros melampus

H1	13	15.25 ± 0.911	(14.09–16.70)
H2	13	17.29 ± 1.036	(15.85–18.90)
H3	13	3.95 ± 0.457	(3.02–4.56)
H4	13	3.24 ± 0.278	(2.61–3.60)
H5	13	3.51 ± 0.316	(2.92–3.89)
H6	13	1.45 ± 0.171	(1.14–1.67)
H7	13	1.79 ± 0.204	(1.37–2.01)
H8	13	2.27 ± 0.253	(1.78–2.62)
U1	13	25.56 ± 2.023	(20.36–27.90)
U2	13	4.99 ± 0.537	(3.84–5.57)
R1	13	20.68 ± 1.619	(16.41–22.70)
R2	13	3.27 ± 0.272	(2.58–3.52)
R3	13	1.83 ± 0.153	(1.54–2.00)
R4	13	3.51 ± 0.295	(2.81–3.89)
R5	13	3.15 ± 0.246	(2.72–3.52)
R6	13	2.16 ± 0.227	(1.75–2.43)
R7	13	1.22 ± 0.094	(1.04–1.36)
MC1	13	21.75 ± 1.614	(17.37–24.20)
MC2	13	2.62 ± 0.172	(2.24–2.81)
MC3	13	1.88 ± 0.330	(1.44–2.87)
MC4	13	2.55 ± 0.219	(2.14–2.86)
MC5	13	1.59 ± 0.133	(1.31–1.85)
MC6	13	1.62 ± 0.127	(1.41–1.78)
MC7	13	1.58 ± 0.156	(1.30–1.85)
F1	13	21.83 ± 1.182	(20.09–23.70)
F2	13	5.46 ± 0.496	(4.29–5.99)
F3	13	4.04 ± 0.280	(3.58–4.48)
F4	13	2.25 ± 0.235	(1.70–2.58)
F5	13	4.31 ± 0.368	(3.39–4.66)
F6	13	1.95 ± 0.166	(1.67–2.18)
F7	13	2.01 ± 0.211	(1.60–2.37)
T1	13	26.63 ± 1.460	(24.17–28.60)
T2	13	5.02 ± 0.396	(4.06–5.47)
T3	13	3.43 ± 0.280	(2.81–3.77)
T4	13	3.20 ± 0.238	(2.65–3.45)
T5	13	2.34 ± 0.136	(2.13–2.56)
T6	13	2.14 ± 0.199	(1.80–2.45)
T7	13	1.89 ± 0.202	(1.46–2.14)
MT1	13	22.51 ± 1.653	(17.75–24.20)
MT2	13	2.51 ± 0.178	(2.10–2.76)
MT3	13	2.54 ± 0.242	(2.03–2.84)
MT4	13	2.59 ± 0.164	(2.27–2.80)
MT5	13	1.61 ± 0.133	(1.36–1.79)
MT6	13	1.53 ± 0.120	(1.33–1.78)
MT7	13	1.79 ± 0.187	(1.36–2.00)
S1	11	18.75 ± 1.448	(16.49–20.53)

APPENDIX 2—(*Continued*)

Ammodorcas clarkei

H1	4	14.37 ± 0.170	(14.20–14.60)
H2	4	15.77 ± 0.350	(15.40–16.20)
H3	4	3.11 ± 0.168	(2.96–3.28)
H4	4	2.72 ± 0.138	(2.58–2.88)
H5	4	2.96 ± 0.145	(2.80–3.14)
H6	4	1.12 ± 0.079	(1.01–1.19)
H7	4	1.45 ± 0.086	(1.34–1.55)
H8	4	1.67 ± 0.074	(1.58–1.76)
U1	4	24.72 ± 0.350	(24.30–25.10)
U2	4	3.73 ± 0.179	(3.57–3.97)
R1	4	20.67 ± 0.170	(20.50–20.90)
R2	4	2.73 ± 0.128	(2.62–2.91)
R3	4	1.74 ± 0.070	(1.64–1.80)
R4	4	2.94 ± 0.164	(2.80–3.09)
R5	4	2.65 ± 0.092	(2.57–2.74)
R6	4	1.66 ± 0.071	(1.58–1.75)
R7	4	1.12 ± 0.148	(0.98–1.33)
MC1	4	25.10 ± 0.697	(24.30–26.00)
MC2	4	2.30 ± 0.084	(2.24–2.43)
MC3	4	1.48 ± 0.148	(1.37–1.69)
MC4	4	2.07 ± 0.127	(1.92–2.21)
MC5	4	1.48 ± 0.075	(1.38–1.56)
MC6	4	1.27 ± 0.045	(1.23–1.33)
MC7	4	1.31 ± 0.061	(1.22–1.35)
F1	4	20.17 ± 0.377	(19.70–20.60)
F2	4	4.94 ± 0.202	(4.76–5.23)
F3	4	3.32 ± 0.068	(3.27–3.42)
F4	4	2.01 ± 0.073	(1.96–2.12)
F5	4	3.81 ± 0.138	(3.66–3.99)
F6	4	1.73 ± 0.059	(1.68–1.81)
F7	4	1.80 ± 0.083	(1.70–1.90)
T1	4	26.35 ± 0.465	(25.90–26.80)
T2	4	4.34 ± 0.212	(4.16–4.60)
T3	4	3.31 ± 0.176	(3.08–3.46)
T4	4	2.93 ± 0.066	(2.84–3.00)
T5	4	2.07 ± 0.107	(1.99–2.23)
T6	4	1.94 ± 0.043	(1.90–2.00)
T7	4	1.53 ± 0.031	(1.50–1.57)
MT1	4	23.67 ± 0.531	(23.00–24.10)
MT2	4	2.33 ± 0.055	(2.28–2.41)
MT3	4	2.49 ± 0.160	(2.35–2.67)
MT4	4	2.44 ± 0.099	(2.31–2.54)
MT5	4	1.61 ± 0.031	(1.57–1.64)
MT6	4	1.36 ± 0.051	(1.30–1.42)
MT7	4	1.74 ± 0.086	(1.66–1.86)
S1	1	14.60	

Litocranius walleri

H1	10	15.40 ± 0.800	(14.55–17.00)
H2	10	16.70 ± 0.915	(15.62–18.50)
H3	10	3.14 ± 0.285	(2.88–3.79)
H4	10	2.81 ± 0.205	(2.60–3.33)
H5	10	3.19 ± 0.181	(3.04–3.67)
H6	10	1.22 ± 0.117	(1.11–1.45)
H7	10	1.67 ± 0.117	(1.54–1.88)
H8	10	1.79 ± 0.104	(1.64–1.99)
U1	10	26.10 ± 1.111	(24.85–28.50)
U2	10	4.12 ± 0.246	(3.78–4.61)
R1	10	21.78 ± 0.978	(20.50–24.00)
R2	10	2.73 ± 0.190	(2.58–3.23)
R3	10	1.84 ± 0.115	(1.72–2.13)
R4	10	3.10 ± 0.215	(2.88–3.64)
R5	10	2.78 ± 0.204	(2.63–3.31)
R6	10	1.95 ± 0.106	(1.81–2.13)
R7	10	1.16 ± 0.079	(1.07–1.30)
MC1	10	27.25 ± 0.977	(26.01–29.40)
MC2	10	2.43 ± 0.189	(2.19–2.87)
MC3	10	1.56 ± 0.086	(1.44–1.74)
MC4	10	2.01 ± 0.177	(1.82–2.45)
MC5	10	1.52 ± 0.100	(1.35–1.70)
MC6	10	1.41 ± 0.113	(1.29–1.68)
MC7	10	1.41 ± 0.071	(1.30–1.51)
F1	10	20.40 ± 0.903	(19.48–22.30)
F2	10	4.75 ± 0.205	(4.43–5.16)
F3	10	3.54 ± 0.224	(3.28–4.04)
F4	10	2.02 ± 0.170	(1.86–2.44)
F5	10	3.88 ± 0.251	(3.59–4.54)
F6	10	1.77 ± 0.114	(1.62–1.97)
F7	10	1.98 ± 0.107	(1.80–2.14)
T1	10	26.71 ± 1.120	(25.50–29.40)
T2	10	4.48 ± 0.242	(4.28–5.03)
T3	10	3.37 ± 0.190	(3.09–3.69)
T4	10	2.91 ± 0.203	(2.66–3.28)
T5	10	2.15 ± 0.067	(2.07–2.27)
T6	10	1.98 ± 0.107	(1.78–2.13)
T7	10	1.67 ± 0.086	(1.55–1.80)
MT1	10	24.36 ± 1.018	(23.15–26.70)
MT2	10	2.24 ± 0.140	(2.12–2.60)
MT3	10	2.45 ± 0.141	(2.24–2.76)
MT4	10	2.32 ± 0.130	(2.15–2.61)
MT5	10	1.67 ± 0.088	(1.55–1.87)
MT6	10	1.41 ± 0.089	(1.34–1.62)
MT7	10	1.74 ± 0.039	(1.68–1.78)
S1	5	15.04 ± 0.397	(14.76–15.73)

Gazella subguttorosa

H1	4	12.07 ± 0.879	(11.00–12.82)
H2	4	13.23 ± 1.019	(11.94–14.17)
H3	4	2.93 ± 0.231	(2.64–3.19)
H4	4	2.43 ± 0.163	(2.21–2.57)
H5	4	2.74 ± 0.225	(2.45–2.92)
H6	4	1.09 ± 0.057	(1.03–1.17)
H7	4	1.37 ± 0.135	(1.18–1.48)
H8	4	1.66 ± 0.134	(1.47–1.76)
U1	4	18.86 ± 1.215	(17.19–19.97)
U2	4	3.70 ± 0.330	(3.26–4.01)
R1	4	15.21 ± 0.960	(13.99–16.25)
R2	4	2.39 ± 0.188	(2.13–2.54)
R3	4	1.46 ± 0.113	(1.31–1.55)
R4	4	2.67 ± 0.222	(2.36–2.85)
R5	4	2.40 ± 01.88	(2.16–2.55)

APPENDIX 2—(*Continued*)

R6	4	1.61 ± 0.152	(1.39–1.72)
R7	4	0.96 ± 0.077	(0.85–1.02)
MC1	4	16.84 ± 1.391	(15.04–18.15)
MC2	4	2.04 ± 0.116	(1.89–2.16)
MC3	4	1.38 ± 0.122	(1.26–1.50)
MC4	4	1.84 ± 0.117	(1.68–1.95)
MC5	4	1.23 ± 0.147	(1.10–1.37)
MC6	4	1.19 ± 0.100	(1.04–1.25)
MC7	4	1.07 ± 0.123	(0.92–1.19)
F1	4	16.47 ± 1.335	(14.80–17.60)
F2	4	4.13 ± 0.388	(3.64–4.57)
F3	4	3.19 ± 0.202	(3.02–3.38)
F4	4	1.77 ± 0.153	(1.63–1.98)
F5	4	3.05 ± 0.266	(2.72–3.30)
F6	4	1.59 ± 0.170	(1.36–1.77)
F7	4	1.52 ± 0.149	(1.31–1.63)
T1	4	20.40 ± 1.080	(19.20–21.43)
T2	4	3.63 ± 0.305	(3.25–3.93)
T3	4	2.64 ± 0.308	(2.28–2.97)
T4	4	2.23 ± 0.243	(1.92–2.48)
T5	4	1.83 ± 0.144	(1.66–1.96)
T6	4	1.58 ± 0.080	(1.47–1.65)
T7	4	1.42 ± 0.308	(1.14–1.86)
MT1	4	17.96 ± 1.333	(16.20–19.17)
MT2	4	1.80 ± 0.089	(1.69–1.91)
MT3	4	1.97 ± 0.106	(1.85–2.08)
MT4	4	1.94 ± 0.125	(1.79–2.07)
MT5	4	1.25 ± 0.136	(1.11–1.39)
MT6	4	1.09 ± 0.080	(0.98–1.16)
MT7	4	1.30 ± 0.149	(1.10–1.43)
S1	2	12.73 ± 1.916	(11.38–14.09)
Gazella dorcas			
H1	3	10.84 ± 0.924	(10.20–11.90)
H2	3	12.04 ± 1.096	(11.28–13.30)
H3	3	2.54 ± 0.208	(2.38–2.78)
H4	3	2.15 ± 0.147	(2.06–2.32)
H5	3	2.25 ± 0.126	(2.16–2.40)
H6	3	0.98 ± 0.081	(0.91–1.07)
H7	3	1.15 ± 0.153	(1.05–1.33)
H8	3	1.34 ± 0.179	(1.23–1.55)
U1	3	17.63 ± 1.874	(16.50–19.80)
U2	3	3.40 ± 0.165	(3.25–3.58)
R1	3	14.17 ± 1.669	(13.15–16.10)
R2	3	2.07 ± 0.125	(1.99–2.22)
R3	3	1.24 ± 0.111	(1.16–1.37)
R4	3	2.32 ± 0.159	(2.22–2.51)
R5	3	2.07 ± 0.123	(1.97–2.21)
R6	3	1.34 ± 0.145	(1.21–1.50)
R7	3	0.83 ± 0.079	(0.74–0.89)
MC1	3	16.30 ± 1.479	(15.30–18.00)
MC2	3	1.74 ± 0.136	(1.65–1.90)
MC3	3	1.17 ± 0.066	(1.10–1.22)
MC4	3	1.60 ± 0.130	(1.51–1.75)
MC5	3	1.03 ± 0.096	(0.96–1.14)
MC6	3	1.02 ± 0.086	(0.95–1.12)
MC7	3	0.95 ± 0.130	(0.85–1.10)
F1	3	15.22 ± 1.020	(14.55–16.40)
F2	3	3.71 ± 0.235	(3.49–3.96)
F3	3	2.75 ± 0.068	(2.68–2.81)
F4	3	1.55 ± 0.162	(1.44–1.74)
F5	3	2.79 ± 0.217	(2.62–3.04)
F6	3	1.33 ± 0.199	(1.16–1.55)
F7	3	1.30 ± 0.189	(1.16–1.52)
T1	3	20.21 ± 1.561	(19.11–22.00)
T2	3	3.28 ± 0.260	(3.09–3.58)
T3	3	2.46 ± 0.180	(2.26–2.61)
T4	3	2.11 ± 0.156	(1.97–2.28)
T5	3	1.62 ± 0.098	(1.54–1.73)
T6	3	1.42 ± 0.150	(1.33–1.60)
T7	3	1.15 ± 0.170	(1.03–1.35)
MT1	3	17.25 ± 1.439	(16.25–18.90)
MT2	3	1.52 ± 0.343	(1.14–1.81)
MT3	3	1.81 ± 0.089	(1.76–1.92)
MT4	3	1.84 ± 0.127	(1.77–1.99)
MT5	3	1.12 ± 0.026	(1.10–1.15)
MT6	3	0.99 ± 0.091	(0.91–1.09)
MT7	3	1.23 ± 0.165	(1.10–1.42)
S1	2	11.48 ± 0.431	(11.18–11.79)
Gazella gazella			
H1	8	11.17 ± 0.582	(10.32–11.90)
H2	8	12.40 ± 0.672	(11.55–13.10)
H3	8	2.57 ± 0.108	(2.42–2.73)
H4	8	2.25 ± 0.120	(2.04–2.45)
H5	8	2.40 ± 0.137	(2.17–2.61)
H6	8	1.01 ± 0.081	(0.92–1.16)
H7	8	1.24 ± 0.067	(1.17–1.40)
H8	8	1.45 ± 0.064	(1.36–1.58)
U1	8	17.85 ± 1.215	(16.22–19.70)
U2	8	3.30 ± 0.261	(2.92–3.65)
R1	8	14.38 ± 1.013	(12.97–16.05)
R2	8	2.22 ± 0.093	(2.02–2.32)
R3	8	1.29 ± 0.081	(1.20–1.43)
R4	8	2.45 ± 0.111	(2.21–2.58)
R5	8	2.17 ± 0.141	(1.96–2.36)
R6	8	1.44 ± 0.068	(1.35–1.55)
R7	8	0.87 ± 0.113	(0.76–1.13)
MC1	8	16.18 ± 1.135	(14.59–18.27)
MC2	8	1.90 ± 0.083	(1.81–2.06)
MC3	8	1.27 ± 0.047	(1.18–1.32)
MC4	8	1.76 ± 0.118	(1.58–1.93)
MC5	8	1.10 ± 0.067	(1.03–1.19)
MC6	8	1.11 ± 0.067	(0.99–1.20)
MC7	8	0.98 ± 0.053	(0.91–1.06)
F1	8	15.52 ± 0.968	(14.23–17.04)
F2	8	3.78 ± 0.194	(3.46–4.07)
F3	8	2.91 ± 0.116	(2.75–3.06)
F4	8	1.61 ± 0.089	(1.51–1.74)
F5	8	2.99 ± 0.159	(2.78–3.21)
F6	8	1.46 ± 0.089	(1.40–1.67)
F7	8	1.38 ± 0.106	(1.19–1.57)

APPENDIX 2—(*Continued*)

T1	8	20.02 ± 1.404	(18.36–22.28)
T2	8	3.46 ± 0.177	(3.26–3.74)
T3	8	2.45 ± 0.255	(2.12–2.91)
T4	8	2.12 ± 0.155	(1.91–2.42)
T5	8	1.70 ± 0.107	(1.56–1.90)
T6	8	1.49 ± 0.099	(1.39–1.72)
T7	8	1.25 ± 0.076	(1.15–1.40)
MT1	8	16.74 ± 1.024	(15.48–18.52)
MT2	8	1.76 ± 0.132	(1.63–1.99)
MT3	8	1.88 ± 0.093	(1.74–2.03)
MT4	8	1.93 ± 0.145	(1.74–2.16)
MT5	8	1.13 ± 0.058	(1.07–1.23)
MT6	8	1.04 ± 0.060	(0.96–1.15)
MT7	8	1.22 ± 0.071	(1.13–1.37)
S1	8	11.89 ± 0.796	(11.00–13.43)

Gazella leptoceros

H1	1	11.50	MC7	1	1.08
H2	1	12.70	F1	1	16.10
H3	1	2.87	F2	1	3.29
H4	1	2.22	F3	1	2.56
H5	1	2.45	F4	1	1.55
H6	1	0.98	F5	1	2.95
H7	1	1.26	F6	1	1.51
H8	1	1.52	F7	1	1.54
U1	1	18.80	T1	1	21.20
U2	1	3.57	T2	1	3.36
R1	1	15.20	T3	1	2.58
R2	1	2.16	T4	1	2.09
R3	1	1.36	T5	1	1.67
R4	1	2.34	T6	1	1.46
R5	1	2.20	T7	1	1.22
R6	1	1.35	MT1	1	18.20
R7	1	0.92	MT2	1	1.82
MC1	1	17.10	MT3	1	1.99
MC2	1	1.85	MT4	1	1.91
MC3	1	1.32	MT5	1	1.20
MC4	1	1.80	MT6	1	1.05
MC5	1	1.27	MT7	1	1.26
MC6	1	1.11	S1	0	

Gazella pelzelni

H1	3	11.37 ± 0.372	(11.10–11.80)
H2	3	12.72 ± 0.410	(12.48–13.20)
H3	3	2.72 ± 0.199	(2.49–2.85)
H4	3	2.16 ± 0.055	(2.11–2.22)
H5	3	2.24 ± 0.055	(2.19–2.30)
H6	3	0.98 ± 0.035	(0.95–1.02)
H7	3	1.18 ± 0.026	(1.15–1.20)
H8	3	1.36 ± 0.010	(1.35–1.37)
U1	3	19.31 ± 0.852	(18.50–20.20)
U2	3	3.46 ± 0.156	(3.36–3.64)
R1	3	15.71 ± 0.600	(15.10–16.30)
R2	3	2.16 ± 0.055	(2.13–2.23)
R3	3	1.28 ± 0.058	(1.22–1.33)
R4	3	2.38 ± 0.080	(2.30–2.46)
R5	3	2.10 ± 0.065	(2.04–2.17)
R6	3	1.34 ± 0.020	(1.32–1.36)
R7	3	0.85 ± 0.026	(0.83–0.88)
MC1	3	17.17 ± 0.283	(17.00–17.50)
MC2	3	1.81 ± 0.061	(1.76–1.88)
MC3	3	1.23 ± 0.049	(1.18–1.27)
MC4	3	1.68 ± 0.052	(1.62–1.72)
MC5	3	1.10 ± 0.045	(1.06–1.15)
MC6	3	1.05 ± 0.058	(0.99–1.10)
MC7	3	0.98 ± 0.041	(0.94–1.02)
F1	3	15.90 ± 0.457	(15.50–16.40)
F2	3	3.69 ± 0.249	(3.41–3.86)
F3	3	2.73 ± 0.066	(2.68–2.81)
F4	3	1.54 ± 0.015	(1.53–1.56)
F5	3	2.87 ± 0.073	(2.79–2.93)
F6	3	1.36 ± 0.065	(1.29–1.42)
F7	3	1.37 ± 0.041	(1.33–1.41)
T1	3	21.28 ± 0.463	(20.90–21.80)
T2	3	3.33 ± 0.105	(3.23–3.44)
T3	3	2.55 ± 0.137	(2.43–2.70)
T4	3	2.04 ± 0.106	(1.93–2.14)
T5	3	1.59 ± 0.056	(1.53–1.64)
T6	3	1.43 ± 0.094	(1.36–1.54)
T7	3	1.23 ± 0.023	(1.22–1.26)
MT1	3	18.05 ± 0.408	(17.70–18.50)
MT2	3	1.71 ± 0.050	(1.67–1.77)
MT3	3	1.80 ± 0.196	(1.58–1.92)
MT4	3	1.85 ± 0.085	(1.76–1.92)
MT5	3	1.10 ± 0.040	(1.06–1.14)
MT6	3	1.10 ± 0.088	(1.03–1.20)
MT7	3	1.18 ± 0.158	(1.00–1.28)
S1	1	11.62	

Gazella spekei

H1	2	11.17 ± 1.202	(10.32–12.02)
H2	2	12.45 ± 1.350	(11.50–13.41)
H3	2	2.65 ± 0.480	(2.31–2.99)
H4	2	2.19 ± 0.403	(1.91–2.48)
H5	2	2.45 ± 0.410	(2.16–2.74)
H6	2	1.11 ± 0.205	(0.97–1.26)
H7	2	1.28 ± 0.183	(1.15–1.41)
H8	2	1.48 ± 0.197	(1.34–1.62)
U1	2	18.73 ± 1.442	(17.71–19.75)
U2	2	3.59 ± 0.742	(3.07–4.12)
R1	2	15.09 ± 0.898	(14.46–15.73)
R2	2	2.20 ± 0.325	(1.97–2.43)
R3	2	1.33 ± 0.247	(1.16–1.51)
R4	2	2.50 ± 0.480	(2.16–2.84)
R5	2	2.19 ± 0.325	(1.96–2.42)
R6	2	1.43 ± 0.282	(1.23–1.63)
R7	2	0.92 ± 0.063	(0.88–0.97)
MC1	2	16.90 ± 0.629	(16.46–17.35)
MC2	2	1.91 ± 0.219	(1.76–2.07)
MC3	2	1.25 ± 0.014	(1.24–1.26)
MC4	2	1.73 ± 0.304	(1.52–1.95)

APPENDIX 2—(*Continued*)

MC5	2	1.15 ± 0.226	(0.99–1.31)
MC6	2	1.09 ± 0.197	(0.95–1.23)
MC7	2	0.96 ± 0.106	(0.89–1.04)
F1	2	15.70 ± 1.682	(14.51–16.89)
F2	2	3.96 ± 0.304	(3.75–4.18)
F3	2	3.04 ± 0.579	(2.63–3.45)
F4	2	1.63 ± 0.247	(1.46–1.81)
F5	2	3.01 ± 0.523	(2.64–3.38)
F6	2	1.45 ± 0.098	(1.38–1.52)
F7	2	1.39 ± 0.176	(1.27–1.52)
T1	2	20.97 ± 1.873	(19.65–22.30)
T2	2	3.44 ± 0.473	(3.11–3.78)
T3	2	2.73 ± 0.466	(2.40–3.06)
T4	2	2.22 ± 0.367	(1.96–2.48)
T5	2	1.67 ± 0.247	(1.50–1.85)
T6	2	1.49 ± 0.155	(1.38–1.60)
T7	2	1.24 ± 0.254	(1.06–1.42)
MT1	2	17.76 ± 0.417	(17.47–18.06)
MT2	2	1.82 ± 0.289	(1.62–2.03)
MT3	2	1.93 ± 0.254	(1.75–2.11)
MT4	2	1.95 ± 0.268	(1.76–2.14)
MT5	2	1.16 ± 0.127	(1.07–1.25)
MT6	2	1.04 ± 0.155	(0.93–1.15)
MT7	2	1.25 ± 0.098	(1.18–1.32)
S1	1	13.31	

Gazella thomsoni

H1	11	11.38 ± 1.070	(10.00–14.30)
H2	11	12.75 ± 1.208	(11.40–16.10)
H3	11	2.72 ± 0.249	(2.50–3.08)
H4	11	2.38 ± 0.172	(2.14–2.80)
H5	11	2.53 ± 0.245	(2.16–3.14)
H6	11	1.09 ± 0.063	(1.00–1.23)
H7	11	1.37 ± 0.101	(1.20–1.52)
H8	11	1.60 ± 0.123	(1.34–1.74)
U1	11	18.66 ± 1.247	(17.30–21.70)
U2	11	3.66 ± 0.286	(3.19–4.08)
R1	11	15.04 ± 0.857	(14.10–17.20)
R2	11	2.35 ± 0.191	(2.05–2.80)
R3	11	1.46 ± 0.184	(1.24–1.93)
R4	11	2.61 ± 0.191	(2.28–3.02)
R5	11	2.29 ± 0.178	(2.03–2.66)
R6	11	1.53 ± 0.117	(1.37–1.70)
R7	11	0.91 ± 0.070	(0.80–1.04)
MC1	11	16.60 ± 0.359	(16.02–17.01)
MC2	11	1.91 ± 0.170	(1.64–2.29)
MC3	11	1.31 ± 0.073	(1.20–1.45)
MC4	11	1.86 ± 0.134	(1.66–2.06)
MC5	11	1.15 ± 0.126	(0.95–1.43)
MC6	11	1.16 ± 0.099	(1.00–1.31)
MC7	11	1.06 ± 0.072	(0.96–1.24)
F1	11	16.53 ± 1.300	(15.20–20.20)
F2	11	4.04 ± 0.345	(3.42–4.59)
F3	11	3.13 ± 0.269	(2.75–3.65)
F4	11	1.67 ± 0.088	(1.53–1.80)
F5	11	3.16 ± 0.220	(2.79–3.56)
F6	11	1.53 ± 0.081	(1.39–1.64)
F7	11	1.41 ± 0.059	(1.30–1.49)
T1	11	20.89 ± 1.372	(19.60–24.80)
T2	11	3.68 ± 0.287	(3.23–4.27)
T3	11	2.71 ± 0.174	(2.37–2.97)
T4	11	2.39 ± 0.177	(2.06–2.72)
T5	11	1.74 ± 0.153	(1.57–2.12)
T6	11	1.60 ± 0.077	(1.47–1.71)
T7	11	1.37 ± 0.097	(1.25–1.60)
MT1	11	16.81 ± 0.492	(16.20–17.80)
MT2	11	1.85 ± 0.151	(1.56–2.03)
MT3	11	1.98 ± 0.089	(1.83–2.09)
MT4	11	2.04 ± 0.131	(1.83–2.26)
MT5	11	1.29 ± 0.325	(1.02–2.21)
MT6	11	1.08 ± 0.105	(0.94–1.32)
MT7	11	1.33 ± 0.060	(1.20–1.40)
S1	5	13.74 ± 1.177	(12.56–15.63)

Gazella tilonura

H1	1	11.90	MC7	1	1.00
H2	1	13.10	F1	1	16.50
H3	1	2.68	F2	1	3.77
H4	1	2.29	F3	1	2.99
H5	1	2.36	F4	1	1.68
H6	1	0.99	F5	1	3.09
H7	1	1.34	F6	1	1.58
H8	1	1.63	F7	1	1.45
U1	1	19.90	T1	1	22.30
U2	1	3.60	T2	1	3.62
R1	1	16.30	T3	1	2.67
R2	1	2.28	T4	1	2.26
R3	1	1.34	T5	1	1.75
R4	1	2.51	T6	1	1.72
R5	1	2.24	T7	1	1.33
R6	1	1.50	MT1	1	18.90
R7	1	0.98	MT2	1	1.82
MC1	1	17.90	MT3	1	1.93
MC2	1	2.01	MT4	1	2.02
MC3	1	1.27	MT5	1	1.24
MC4	1	1.80	MT6	1	1.20
MC5	1	1.16	MT7	1	1.37
MC6	1	1.26	S1	0	

Gazella dama

H1	1	17.50	MC7	1	1.49
H2	1	19.30	F1	1	23.70
H3	1	3.92	F2	1	5.96
H4	1	3.55	F3	1	3.97
H5	1	3.71	F4	1	2.49
H6	1	1.73	F5	1	4.72
H7	1	1.95	F6	1	2.11
H8	1	2.15	F7	1	1.90
U1	1	32.30	T1	1	30.80
U2	1	5.77	T2	1	5.56
R1	1	26.70	T3	1	3.95

APPENDIX 2—(*Continued*)

R2	1	3.48	T4	1	3.48
R3	1	2.26	T5	1	2.56
R4	1	4.01	T6	1	2.21
R5	1	3.70	T7	1	1.74
R6	1	2.09	MT1	1	28.50
R7	1	1.33	MT2	1	2.86
MC1	1	28.70	MT3	1	2.98
MC2	1	3.08	MT4	1	2.93
MC3	1	2.05	MT5	1	1.94
MC4	1	2.63	MT6	1	1.45
MC5	1	1.74	MT7	1	1.84
MC6	1	1.57	S1	1	19.80

Gazella granti

H1	17	15.63 ± 0.883	(14.10–16.60)
H2	17	17.46 ± 1.037	(15.70–18.60)
H3	17	3.85 ± 0.373	(3.03–4.34)
H4	17	3.27 ± 0.229	(2.76–3.62)
H5	17	3.64 ± 0.247	(3.13–4.03)
H6	17	1.49 ± 0.118	(1.29–1.81)
H7	17	1.95 ± 0.200	(1.57–2.33)
H8	17	2.27 ± 0.224	(1.80–2.64)
U1	17	25.73 ± 1.511	(23.10–27.80)
U2	17	5.36 ± 0.539	(4.28–6.08)
R1	17	20.53 ± 1.111	(18.40–22.00)
R2	17	3.26 ± 0.216	(2.79–3.57)
R3	17	2.00 ± 0.136	(1.78–2.19)
R4	17	3.68 ± 0.262	(3.10–4.06)
R5	17	3.28 ± 0.238	(2.78–3.52)
R6	17	2.22 ± 0.215	(1.73–2.46)
R7	17	1.29 ± 0.109	(1.09–1.50)
MC1	17	22.50 ± 0.800	(21.10–23.60)
MC2	17	2.71 ± 0.158	(2.34–2.94)
MC3	17	1.80 ± 0.134	(1.55–2.02)
MC4	17	2.53 ± 0.184	(2.10–2.72)
MC5	17	1.67 ± 0.127	(1.42–1.88)
MC6	17	1.63 ± 0.136	(1.33–1.81)
MC7	17	1.50 ± 0.088	(1.34–1.62)
F1	17	22.36 ± 1.151	(20.40–24.40)
F2	17	5.70 ± 0.460	(4.78–6.38)
F3	17	4.17 ± 0.314	(3.57–4.67)
F4	17	2.40 ± 0.194	(2.10–2.68)
F5	17	4.33 ± 0.278	(3.67–4.74)
F6	17	2.07 ± 0.155	(1.75–2.35)
F7	17	2.07 ± 0.177	(1.68–2.36)
T1	17	27.17 ± 1.355	(24.70–29.10)
T2	17	5.02 ± 0.322	(4.25–5.46)
T3	17	3.69 ± 0.301	(2.99–4.09)
T4	17	3.06 ± 0.151	(2.79–3.26)
T5	17	2.37 ± 0.157	(2.06–2.58)
T6	17	2.28 ± 0.157	(1.97–2.56)
T7	17	1.86 ± 0.141	(1.59–2.11)
MT1	17	23.15 ± 0.925	(21.40–24.40)
MT2	17	2.59 ± 0.145	(2.28–2.78)
MT3	17	2.71 ± 0.153	(2.40–2.98)
MT4	17	2.75 ± 0.156	(2.35–2.92)
MT5	17	1.72 ± 0.100	(1.51–1.88)
MT6	17	1.52 ± 0.109	(1.26–1.67)
MT7	17	1.88 ± 0.116	(1.59–2.04)
S1	8	18.24 ± 1.296	(15.93–20.16)

Gazella soemmerringi

H1	2	14.90 ± 0.565	(14.50–15.30)
H2	2	16.35 ± 0.636	(15.90–16.80)
H3	2	3.94 ± 0.494	(3.59–4.29)
H4	2	3.16 ± 0.148	(3.06–3.27)
H5	2	3.45 ± 0.268	(3.26–3.64)
H6	2	1.44 ± 0.028	(1.42–1.46)
H7	2	1.84 ± 0.282	(1.64–2.04)
H8	2	2.15 ± 0.304	(1.94–2.37)
U1	2	24.80 ± 0.424	(24.50–25.10)
U2	2	4.81 ± 0.254	(4.63–4.99)
R1	2	20.25 ± 0.494	(19.90–20.60)
R2	2	3.06 ± 0.233	(2.90–3.23)
R3	2	1.91 ± 0.141	(1.81–2.01)
R4	2	3.42 ± 0.304	(3.21–3.64)
R5	2	3.06 ± 0.113	(2.98–3.14)
R6	2	2.04 ± 0.084	(1.98–2.10)
R7	2	1.18 ± 0.113	(1.10–1.26)
MC1	2	21.65 ± 0.212	(21.50–21.80)
MC2	2	2.49 ± 0.155	(2.38–2.60)
MC3	2	1.73 ± 0.127	(1.64–1.82)
MC4	2	2.37 ± 0.190	(2.24–2.51)
MC5	2	1.59 ± 0.183	(1.46–1.72)
MC6	2	1.52 ± 0.141	(1.42–1.62)
MC7	2	1.37 ± 0.021	(1.36–1.39)
F1	2	21.20 ± 0.848	(20.60–21.80)
F2	2	4.90 ± 0.162	(4.79–5.02)
F3	2	4.01 ± 0.212	(3.86–4.16)
F4	2	2.33 ± 0.169	(2.21–2.45)
F5	2	3.04 ± 1.209	(2.19–3.90)
F6	2	1.90 ± 0.113	(1.82–1.98)
F7	2	1.97 ± 0.247	(1.80–2.15)
T1	2	26.50 ± 0.141	(26.40–26.60)
T2	2	4.64 ± 0.289	(4.44–4.85)
T3	2	3.22 ± 0.424	(2.92–3.52)
T4	2	2.87 ± 0.148	(2.77–2.98)
T5	2	2.21 ± 0.084	(2.15–2.27)
T6	2	2.06 ± 0.212	(1.91–2.21)
T7	2	1.76 ± 0.028	(1.74–1.78)
MT1	2	22.90 ± 0.141	(22.80–23.00)
MT2	2	2.43 ± 0.127	(2.34–2.52)
MT3	2	2.44 ± 0.000	(2.44–2.44)
MT4	2	2.52 ± 0.134	(2.43–2.62)
MT5	2	1.63 ± 0.155	(1.52–1.74)
MT6	2	1.40 ± 0.169	(1.28–1.52)
MT7	2	1.78 ± 0.084	(1.72–1.84)
S1	0		

APPENDIX 2—(*Continued*)

Gazella cuvieri

H1	2	13.50 ± 0.282	(13.30–13.70)
H2	2	15.05 ± 0.212	(14.90–15.20)
H3	2	3.35 ± 0.049	(3.32–3.39)
H4	2	2.87 ± 0.056	(2.83–2.91)
H5	2	3.06 ± 0.014	(3.05–3.07)
H6	2	1.24 ± 0.063	(1.20–1.29)
H7	2	1.53 ± 0.035	(1.51–1.56)
H8	2	1.77 ± 0.049	(1.74–1.81)
U1	2	20.55 ± 0.212	(20.40–20.70)
U2	2	4.36 ± 0.070	(4.31–4.41)
R1	2	16.20 ± 0.565	(15.80–16.60)
R2	2	2.81 ± 0.021	(2.80–2.83)
R3	2	1.66 ± 0.007	(1.66–1.67)
R4	2	3.04 ± 0.084	(2.98–3.10)
R5	2	2.74 ± 0.021	(2.73–2.76)
R6	2	1.79 ± 0.106	(1.72–1.87)
R7	2	1.01 ± 0.042	(0.98–1.04)
MC1	2	16.90 ± 1.272	(16.00–17.80)
MC2	2	2.35 ± 0.000	(2.35–2.35)
MC3	2	1.67 ± 0.141	(1.57–1.77)
MC4	2	2.21 ± 0.014	(2.20–2.22)
MC5	2	1.33 ± 0.091	(1.27–1.40)
MC6	2	1.40 ± 0.056	(1.36–1.44)
MC7	2	1.15 ± 0.077	(1.10–1.21)
F1	2	18.75 ± 0.494	(18.40–19.10)
F2	2	4.38 ± 0.190	(4.25–4.52)
F3	2	3.33 ± 0.007	(3.33–3.34)
F4	2	1.88 ± 0.035	(1.86–1.91)
F5	2	3.61 ± 0.091	(3.55–3.68)
F6	2	1.64 ± 0.056	(1.60–1.68)
F7	2	1.69 ± 0.169	(1.57–1.81)
T1	2	22.80 ± 0.707	(22.30–23.30)
T2	2	4.13 ± 0.091	(4.07–4.20)
T3	2	3.04 ± 0.148	(2.94–3.15)
T4	2	2.69 ± 0.007	(2.69–2.70)
T5	2	2.05 ± 0.106	(1.98–2.13)
T6	2	1.69 ± 0.063	(1.65–1.74)
T7	2	1.45 ± 0.148	(1.35–1.56)
MT1	2	18.05 ± 1.343	(17.10–19.00)
MT2	2	2.14 ± 0.028	(2.12–2.16)
MT3	2	2.23 ± 0.042	(2.20–2.26)
MT4	2	2.42 ± 0.007	(2.42–2.43)
MT5	2	1.47 ± 0.007	(1.47–1.48)
MT6	2	1.29 ± 0.056	(1.25–1.33)
MT7	2	1.41 ± 0.162	(1.30–1.53)
S1	0		

Antidorcas marsupialis

H1	8	12.40 ± 0.492	(11.30–12.90)
H2	8	13.90 ± 0.602	(12.60–14.70)
H3	8	3.16 ± 0.219	(2.85–3.40)
H4	8	2.63 ± 0.124	(2.41–2.78)
H5	8	2.93 ± 0.150	(2.69–3.13)
H6	8	1.23 ± 0.062	(1.12–1.30)
H7	8	1.53 ± 0.113	(1.36–1.67)
H8	8	1.79 ± 0.135	(1.65–1.95)
U1	8	21.68 ± 1.093	(19.40–22.89)
U2	8	4.28 ± 0.282	(3.89–4.71)
R1	8	17.36 ± 0.868	(15.60–18.33)
R2	8	2.62 ± 0.141	(2.42–2.83)
R3	8	1.64 ± 0.087	(1.52–1.77)
R4	8	2.99 ± 0.157	(2.76–3.19)
R5	8	2.67 ± 0.181	(2.42–2.98)
R6	8	1.74 ± 0.091	(1.64–1.87)
R7	8	1.06 ± 0.089	(0.93–1.20)
MC1	8	19.81 ± 1.144	(17.80–21.20)
MC2	8	2.33 ± 0.089	(2.17–2.46)
MC3	8	1.58 ± 0.082	(1.47–1.72)
MC4	8	2.12 ± 0.141	(1.92–2.30)
MC5	8	1.33 ± 0.058	(1.23–1.41)
MC6	8	1.35 ± 0.081	(1.24–1.45)
MC7	8	1.29 ± 0.091	(1.14–1.39)
F1	8	18.08 ± 0.857	(16.30–19.30)
F2	8	4.54 ± 0.217	(4.21–4.78)
F3	8	3.52 ± 0.492	(3.14–4.68)
F4	8	1.91 ± 0.098	(1.77–2.08)
F5	8	3.50 ± 0.123	(3.31–3.70)
F6	8	1.62 ± 0.218	(1.20–1.92)
F7	8	1.56 ± 0.090	(1.46–1.71)
T1	8	22.36 ± 0.997	(20.50–23.70)
T2	8	4.12 ± 0.179	(3.81–4.27)
T3	8	2.98 ± 0.224	(2.57–3.22)
T4	8	2.71 ± 0.167	(2.44–2.95)
T5	8	2.03 ± 0.104	(1.86–2.17)
T6	8	1.86 ± 0.128	(1.71–2.07)
T7	8	1.47 ± 0.148	(1.26–1.78)
MT1	8	20.76 ± 1.132	(18.70–22.20)
MT2	8	2.16 ± 0.120	(1.97–2.29)
MT3	8	2.30 ± 0.114	(2.11–2.48)
MT4	8	2.23 ± 0.108	(2.05–2.33)
MT5	8	1.40 ± 0.084	(1.26–1.54)
MT6	8	1.21 ± 0.088	(1.06–1.33)
MT7	8	1.56 ± 0.068	(1.48–1.68)
S1	7	15.42 ± 0.788	(13.78–16.15)

Procapra guttorosa

H1	2	12.60 ± 0.424	(12.30–12.90)
H2	2	14.08 ± 0.742	(13.56–14.61)
H3	2	2.83 ± 0.247	(2.66–3.01)
H4	2	2.70 ± 0.141	(2.60–2.80)
H5	2	2.68 ± 0.113	(2.60–2.76)
H6	2	1.16 ± 0.049	(1.13–1.20)
H7	2	1.46 ± 0.000	(1.46–1.46)
H8	2	1.80 ± 0.091	(1.74–1.87)
U1	2	19.06 ± 0.657	(18.60–19.53)
U2	2	3.98 ± 0.240	(3.81–4.15)
R1	2	15.00 ± 0.509	(14.64–15.36)
R2	2	2.72 ± 0.148	(2.62–2.83)

APPENDIX 2—(*Continued*)

R3	2	1.45 ± 0.014	(1.44–1.46)
R4	2	2.84 ± 0.148	(2.74–2.95)
R5	2	2.48 ± 0.127	(2.39–2.57)
R6	2	1.62 ± 0.000	(1.62–1.62)
R7	2	0.92 ± 0.007	(0.92–0.93)
MC1	2	16.58 ± 0.494	(16.23–16.93)
MC2	2	2.10 ± 0.084	(2.04–2.16)
MC3	2	1.78 ± 0.367	(1.52–2.04)
MC4	2	2.01 ± 0.077	(1.96–2.07)
MC5	2	1.32 ± 0.063	(1.28–1.37)
MC6	2	1.26 ± 0.049	(1.23–1.30)
MC7	2	1.06 ± 0.014	(1.05–1.07)
F1	2	17.10 ± 0.601	(16.68–17.53)
F2	2	4.37 ± 0.431	(4.07–4.68)
F3	2	3.32 ± 0.127	(3.23–3.41)
F4	2	1.84 ± 0.007	(1.84–1.85)
F5	2	3.18 ± 0.141	(3.08–3.28)
F6	2	1.63 ± 0.028	(1.61–1.65)
F7	2	1.40 ± 0.141	(1.30–1.50)
T1	2	20.18 ± 0.572	(19.78–20.59)
T2	2	3.81 ± 0.106	(3.74–3.89)
T3	2	2.69 ± 0.084	(2.63–2.75)
T4	2	2.40 ± 0.035	(2.38–2.43)
T5	2	1.93 ± 0.007	(1.93–1.94)
T6	2	1.60 ± 0.035	(1.58–1.63)
T7	2	1.48 ± 0.148	(1.38–1.59)
MT1	2	17.08 ± 0.622	(16.64–17.52)
MT2	2	1.97 ± 0.042	(1.94–2.00)
MT3	2	2.08 ± 0.021	(2.07–2.10)
MT4	2	2.06 ± 0.106	(1.99–2.14)
MT5	2	1.39 ± 0.056	(1.35–1.43)
MT6	2	1.20 ± 0.084	(1.14–1.26)
MT7	2	1.29 ± 0.028	(1.27–1.31)
S1	2	14.65 ± 1.053	(13.91–15.40)

Panthalops hodgsoni

H1	2	15.55 ± 0.212	(15.40–15.70)
H2	2	17.25 ± 0.212	(17.10–17.40)
H3	2	3.64 ± 0.197	(3.50–3.78)
H4	2	3.06 ± 0.021	(3.05–3.08)
H5	2	3.31 ± 0.035	(3.29–3.34)
H6	2	1.20 ± 0.035	(1.18–1.23)
H7	2	1.70 ± 0.077	(1.65–1.76)
H8	2	2.06 ± 0.049	(2.03–2.10)
U1	2	23.45 ± 0.212	(23.30–23.60)
U2	2	5.17 ± 0.247	(5.00–5.35)
R1	2	18.60 ± 0.000	(18.60–18.60)
R2	2	3.11 ± 0.127	(3.02–3.20)
R3	2	1.64 ± 0.056	(1.60–1.68)
R4	2	3.55 ± 0.056	(3.51–3.59)
R5	2	3.13 ± 0.127	(3.04–3.22)
R6	2	1.86 ± 0.021	(1.85–1.88)
R7	2	1.14 ± 0.056	(1.10–1.18)
MC1	2	17.60 ± 0.141	(17.50–17.70)
MC2	2	2.55 ± 0.049	(2.52–2.59)
MC3	2	1.70 ± 0.091	(1.64–1.77)
MC4	2	2.34 ± 0.042	(2.31–2.37)
MC5	2	1.49 ± 0.063	(1.45–1.54)
MC6	2	1.43 ± 0.021	(1.42–1.45)
MC7	2	1.27 ± 0.063	(1.23–1.32)
F1	2	19.75 ± 0.212	(19.60–19.90)
F2	2	4.84 ± 0.339	(4.60–5.08)
F3	2	3.29 ± 0.346	(3.05–3.54)
F4	2	1.90 ± 0.084	(1.84–1.96)
F5	2	3.58 ± 0.183	(3.45–3.71)
F6	2	1.77 ± 0.120	(1.69–1.86)
F7	2	1.73 ± 0.098	(1.66–1.80)
T1	2	22.90 ± 0.424	(22.60–23.20)
T2	2	4.33 ± 0.134	(4.24–4.43)
T3	2	2.98 ± 0.084	(2.92–3.04)
T4	2	2.72 ± 0.070	(2.67–2.77)
T5	2	2.08 ± 0.035	(2.06–2.11)
T6	2	1.70 ± 0.056	(1.66–1.74)
T7	2	1.70 ± 0.084	(1.64–1.76)
MT1	2	19.80 ± 0.282	(19.60–20.00)
MT2	2	2.20 ± 0.014	(2.19–2.21)
MT3	2	2.38 ± 0.056	(2.34–2.42)
MT4	2	2.26 ± 0.042	(2.23–2.29)
MT5	2	1.35 ± 0.091	(1.29–1.42)
MT6	2	1.30 ± 0.021	(1.29–1.32)
MT7	2	1.53 ± 0.028	(1.51–1.55)
S1	0		

Saiga tatarica

H1	2	14.20 ± 0.848	(13.60–14.80)
H2	2	15.60 ± 0.848	(15.00–16.20)
H3	2	3.31 ± 0.233	(3.15–3.48)
H4	2	2.83 ± 0.197	(2.69–2.97)
H5	2	2.97 ± 0.346	(2.73–3.22)
H6	2	1.40 ± 0.098	(1.33–1.47)
H7	2	1.68 ± 0.233	(1.52–1.85)
H8	2	1.98 ± 0.219	(1.83–2.14)
U1	2	21.05 ± 1.202	(20.20–21.90)
U2	2	4.30 ± 0.700	(3.81–4.80)
R1	2	16.65 ± 0.777	(16.10–17.20)
R2	2	2.91 ± 0.254	(2.73–3.09)
R3	2	1.59 ± 0.084	(1.53–1.65)
R4	2	3.19 ± 0.325	(2.96–3.42)
R5	2	2.88 ± 0.226	(2.72–3.04)
R6	2	1.82 ± 0.247	(1.65–2.00)
R7	2	1.10 ± 0.084	(1.04–1.16)
MC1	2	15.20 ± 0.282	(15.00–15.40)
MC2	2	2.30 ± 0.254	(2.12–2.48)
MC3	2	1.44 ± 0.056	(1.40–1.48)
MC4	2	2.28 ± 0.155	(2.17–2.39)
MC5	2	1.31 ± 0.148	(1.21–1.42)
MC6	2	1.31 ± 0.155	(1.20–1.42)
MC7	2	1.23 ± 0.021	(1.22–1.25)
F1	2	18.25 ± 0.777	(17.70–18.80)
F2	2	4.50 ± 0.692	(4.01–4.99)
F3	2	3.47 ± 0.459	(3.15–3.80)
F4	2	2.04 ± 0.127	(1.95–2.13)

APPENDIX 2—(*Continued*)

F5	2	3.38 ± 0.190	(3.25–3.52)
F6	2	1.70 ± 0.254	(1.52–1.88)
F7	2	1.57 ± 0.134	(1.48–1.67)
T1	2	20.80 ± 0.848	(20.20–21.40)
T2	2	3.95 ± 0.247	(3.78–4.13)
T3	2	2.74 ± 0.169	(2.62–2.86)
T4	2	2.38 ± 0.120	(2.30–2.47)
T5	2	1.92 ± 0.120	(1.84–2.01)
T6	2	1.62 ± 0.162	(1.51–1.74)
T7	2	1.44 ± 0.155	(1.33–1.55)
MT1	2	17.20 ± 0.565	(16.80–17.60)
MT2	2	1.99 ± 0.084	(1.93–2.05)
MT3	2	2.04 ± 0.127	(1.95–2.13)
MT4	2	2.17 ± 0.148	(2.07–2.28)
MT5	2	1.16 ± 0.091	(1.10–1.23)
MT6	2	1.09 ± 0.084	(1.03–1.15)
MT7	2	1.37 ± 0.070	(1.32–1.42)
S1	2	16.21 ± 1.251	(15.33–17.10)

Naemorhedus goral

H1	12	16.37 ± 0.906	(15.00–18.00)
H2	12	18.05 ± 1.079	(16.10–19.90)
H3	12	3.18 ± 0.265	(2.76–3.64)
H4	12	3.03 ± 0.227	(2.42–3.33)
H5	12	3.38 ± 0.217	(2.85–3.76)
H6	12	1.24 ± 0.124	(0.99–1.40)
H7	12	1.66 ± 0.138	(1.40–1.87)
H8	12	2.01 ± 0.189	(1.72–2.32)
U1	12	20.68 ± 1.518	(17.40–23.30)
U2	12	4.36 ± 0.354	(3.63–4.98)
R1	12	15.88 ± 1.105	(13.80–17.80)
R2	12	2.95 ± 0.193	(2.41–3.16)
R3	12	1.53 ± 0.075	(1.36–1.66)
R4	12	3.06 ± 0.199	(2.46–3.23)
R5	12	2.97 ± 0.252	(2.37–3.32)
R6	12	2.02 ± 0.142	(1.72–2.25)
R7	12	1.21 ± 0.111	(1.01–1.41)
MC1	12	11.82 ± 0.635	(10.80–13.00)
MC2	12	2.60 ± 0.198	(2.05–2.77)
MC3	12	1.62 ± 0.148	(1.23–1.74)
MC4	12	2.68 ± 0.251	(2.06–2.97)
MC5	12	1.30 ± 0.099	(1.11–1.43)
MC6	12	1.73 ± 0.162	(1.43–2.00)
MC7	12	1.22 ± 0.102	(1.00–1.42)
F1	12	19.64 ± 0.935	(18.30–21.60)
F2	12	4.40 ± 0.275	(4.06–5.00)
F3	12	3.75 ± 0.221	(3.40–4.24)
F4	12	1.75 ± 0.082	(1.66–1.94)
F5	12	3.67 ± 0.149	(3.54–4.09)
F6	12	1.65 ± 0.111	(1.51–1.82)
F7	12	1.78 ± 0.126	(1.64–2.12)
T1	12	22.70 ± 1.066	(21.20–24.90)
T2	12	4.36 ± 0.198	(4.14–4.84)
T3	12	2.61 ± 0.115	(2.37–2.81)
T4	12	2.76 ± 0.114	(2.63–3.01)
T5	12	1.96 ± 0.087	(1.84–2.10)
T6	12	1.71 ± 0.129	(1.56–1.99)
T7	12	1.56 ± 0.115	(1.43–1.86)
MT1	12	12.62 ± 0.759	(11.80–14.30)
MT2	12	2.18 ± 0.126	(1.98–2.35)
MT3	12	1.94 ± 0.123	(1.78–2.16)
MT4	12	2.51 ± 0.149	(2.25–2.73)
MT5	12	1.28 ± 0.085	(1.13–1.39)
MT6	12	1.40 ± 0.126	(1.17–1.65)
MT7	12	1.26 ± 0.058	(1.17–1.36)
S1	5	15.48 ± 0.708	(14.92–16.47)

Capricornis crispus

H1	8	23.21 ± 1.331	(20.90–24.30)
H2	8	25.70 ± 1.474	(23.00–27.00)
H3	8	4.84 ± 0.402	(4.28–5.54)
H4	8	4.63 ± 0.326	(3.92–4.89)
H5	8	4.94 ± 0.299	(4.43–5.33)
H6	8	1.90 ± 0.231	(1.62–2.26)
H7	8	2.36 ± 0.156	(2.06–2.55)
H8	8	2.90 ± 0.342	(2.25–3.28)
U1	8	29.21 ± 2.095	(26.30–31.70)
U2	8	6.46 ± 0.565	(5.72–7.34)
R1	8	22.27 ± 1.537	(20.10–23.90)
R2	8	4.50 ± 0.274	(4.00–4.88)
R3	8	2.32 ± 0.186	(1.94–2.60)
R4	8	4.62 ± 0.338	(3.98–4.96)
R5	8	4.50 ± 0.317	(3.90–4.92)
R6	8	2.72 ± 0.194	(2.30–2.92)
R7	8	1.76 ± 0.168	(1.46–1.94)
MC1	8	16.37 ± 1.020	(14.50–17.50)
MC2	8	3.77 ± 0.232	(3.36–4.06)
MC3	8	2.30 ± 0.162	(2.01–2.48)
MC4	8	4.01 ± 0.181	(3.72–4.17)
MC5	8	1.94 ± 0.151	(1.69–2.15)
MC6	8	2.56 ± 0.168	(2.27–2.81)
MC7	8	1.71 ± 0.163	(1.39–1.93)
F1	8	27.36 ± 1.353	(25.00–28.70)
F2	8	6.34 ± 0.482	(5.61–6.92)
F3	8	5.38 ± 0.367	(4.83–5.79)
F4	8	2.78 ± 0.292	(2.20–3.12)
F5	8	5.29 ± 0.363	(4.63–5.71)
F6	8	2.30 ± 0.160	(2.05–2.46)
F7	8	2.48 ± 0.220	(2.11–2.75)
T1	8	30.32 ± 2.072	(26.80–32.30)
T2	8	6.32 ± 0.439	(5.61–6.84)
T3	8	3.81 ± 0.287	(3.36–4.16)
T4	8	4.12 ± 0.191	(3.79–4.42)
T5	8	2.82 ± 0.188	(2.45–3.02)
T6	8	2.38 ± 0.180	(2.09–2.61)
T7	8	2.14 ± 0.200	(1.75–2.43)
MT1	8	16.77 ± 0.917	(15.40–17.80)
MT2	8	3.14 ± 0.203	(2.83–3.49)
MT3	8	2.80 ± 0.129	(2.56–2.99)
MT4	8	3.79 ± 0.207	(3.44–4.00)
MT5	8	1.90 ± 0.135	(1.71–2.07)
MT6	8	2.14 ± 0.156	(1.83–2.30)

APPENDIX 2—(*Continued*)

MT7	8	1.77 ± 0.119	(1.56–1.94)
S1	3	22.80 ± 1.248	(21.40–23.80)

Capricornis sumatraensis

H1	8	23.21 ± 1.331	(20.90–24.30)
H2	8	25.70 ± 1.474	(23.00–27.00)
H3	8	4.84 ± 0.402	(4.28–5.54)
H4	8	4.63 ± 0.326	(3.92–4.89)
H5	8	4.94 ± 0.299	(4.43–5.33)
H6	8	1.90 ± 0.231	(1.62–2.26)
H7	8	2.36 ± 0.156	(2.06–2.55)
H8	8	2.90 ± 0.342	(2.25–3.28)
U1	8	29.21 ± 2.095	(26.30–31.70)
U2	8	6.46 ± 0.565	(5.72–7.34)
R1	8	22.27 ± 1.537	(20.10–23.90)
R2	8	4.50 ± 0.274	(4.00–4.88)
R3	8	2.32 ± 0.186	(1.94–2.60)
R4	8	4.62 ± 0.338	(3.98–4.96)
R5	8	4.50 ± 0.317	(3.90–4.92)
R6	8	2.72 ± 0.194	(2.30–2.92)
R7	8	1.76 ± 0.168	(1.46–1.94)
MC1	8	16.37 ± 1.020	(14.50–17.50)
MC2	8	3.77 ± 0.232	(3.36–4.06)
MC3	8	2.30 ± 0.162	(2.01–2.48)
MC4	8	4.01 ± 0.181	(3.72–4.17)
MC5	8	1.94 ± 0.151	(1.69–2.15)
MC6	8	2.56 ± 0.168	(2.27–2.81)
MC7	8	1.71 ± 0.163	(1.39–1.93)
F1	8	27.36 ± 1.353	(25.00–28.70)
F2	8	6.34 ± 0.482	(5.61–6.92)
F3	8	5.38 ± 0.367	(4.83–5.79)
F4	8	2.78 ± 0.292	(2.20–3.12)
F5	8	5.29 ± 0.363	(4.63–5.71)
F6	8	2.30 ± 0.160	(2.05–2.46)
F7	8	2.48 ± 0.220	(2.11–2.75)
T1	8	30.32 ± 2.072	(26.80–32.30)
T2	8	6.32 ± 0.439	(5.61–6.84)
T3	8	3.81 ± 0.287	(3.36–4.16)
T4	8	4.12 ± 0.191	(3.79–4.42)
T5	8	2.82 ± 0.188	(2.45–3.02)
T6	8	2.38 ± 0.180	(2.09–2.61)
T7	8	2.14 ± 0.200	(1.75–2.43)
MT1	8	16.77 ± 0.917	(15.40–17.80)
MT2	8	3.14 ± 0.203	(2.83–3.49)
MT3	8	2.80 ± 0.129	(2.56–2.99)
MT4	8	3.79 ± 0.207	(3.44–4.00)
MT5	8	1.90 ± 0.135	(1.71–2.07)
MT6	8	2.14 ± 0.156	(1.83–2.30)
MT7	8	1.77 ± 0.119	(1.56–1.94)
S1	3	22.80 ± 1.248	(21.40–23.80)

Capricornis crispus

H1	2	17.70 ± 2.262	(16.10–19.30)
H2	2	19.50 ± 2.404	(17.80–21.20)
H3	2	3.30 ± 0.629	(2.86–3.75)
H4	2	3.42 ± 0.494	(3.07–3.77)
H5	2	3.62 ± 0.381	(3.35–3.89)
H6	2	1.43 ± 0.056	(1.39–1.47)
H7	2	1.75 ± 0.318	(1.53–1.98)
H8	2	2.00 ± 0.289	(1.80–2.21)
U1	2	22.40 ± 3.252	(20.10–24.70)
U2	2	4.51 ± 0.254	(4.33–4.69)
R1	2	17.25 ± 2.474	(15.50–19.00)
R2	2	3.31 ± 0.431	(3.01–3.62)
R3	2	1.71 ± 0.233	(1.55–1.88)
R4	2	3.49 ± 0.537	(3.11–3.87)
R5	2	3.25 ± 0.452	(2.93–3.57)
R6	2	1.92 ± 0.240	(1.75–2.09)
R7	2	1.30 ± 0.247	(1.13–1.48)
MC1	2	12.15 ± 1.626	(11.00–13.30)
MC2	2	2.75 ± 0.424	(2.45–3.05)
MC3	2	1.64 ± 0.296	(1.43–1.85)
MC4	2	2.91 ± 0.410	(2.62–3.20)
MC5	2	1.41 ± 0.226	(1.25–1.57)
MC6	2	1.83 ± 0.332	(1.60–2.07)
MC7	2	1.21 ± 0.183	(1.08–1.34)
F1	2	20.90 ± 2.828	(18.90–22.90)
F2	2	4.50 ± 0.657	(4.04–4.97)
F3	2	3.87 ± 0.707	(3.37–4.37)
F4	2	1.86 ± 0.183	(1.73–1.99)
F5	2	3.84 ± 0.403	(3.56–4.13)
F6	2	1.79 ± 0.240	(1.62–1.96)
F7	2	1.64 ± 0.120	(1.56–1.73)
T1	2	23.60 ± 2.828	(21.60–25.60)
T2	2	4.49 ± 0.502	(4.14–4.85)
T3	2	2.66 ± 0.530	(2.29–3.04)
T4	2	2.67 ± 1.202	(1.82–3.52)
T5	2	2.54 ± 0.417	(2.25–2.84)
T6	2	1.59 ± 0.254	(1.41–1.77)
T7	2	1.50 ± 0.106	(1.43–1.58)
MT1	2	12.75 ± 1.484	(11.70–13.80)
MT2	2	2.29 ± 0.304	(2.08–2.51)
MT3	2	2.10 ± 0.325	(1.87–2.33)
MT4	2	2.84 ± 0.417	(2.55–3.14)
MT5	2	1.33 ± 0.197	(1.19–1.47)
MT6	2	1.52 ± 0.240	(1.35–1.69)
MT7	2	1.24 ± 0.226	(1.08–1.40)
S1	2	16.39 ± 1.845	(15.09–17.70)

Oreamnos americanus

H1	2	23.40 ± 1.131	(22.60–24.20)
H2	2	25.60 ± 1.838	(24.30–26.90)
H3	2	4.79 ± 0.381	(4.52–5.06)
H4	2	4.76 ± 0.106	(4.69–4.84)
H5	2	4.68 ± 0.035	(4.66–4.71)
H6	2	1.71 ± 0.205	(1.57–1.86)
H7	2	2.52 ± 0.127	(2.43–2.61)
H8	2	3.56 ± 0.120	(3.48–3.65)
U1	2	29.35 ± 2.050	(27.90–30.80)
U2	2	6.58 ± 0.197	(6.44–6.72)
R1	2	22.35 ± 1.202	(21.50–23.20)

APPENDIX 2—(*Continued*)

R2	2	4.61 ± 0.098	(4.54–4.68)
R3	2	2.29 ± 0.169	(2.17–2.41)
R4	2	4.82 ± 0.007	(4.82–4.83)
R5	2	4.49 ± 0.028	(4.47–4.51)
R6	2	2.72 ± 0.070	(2.67–2.77)
R7	2	1.75 ± 0.120	(1.67–1.84)
MC1	2	11.46 ± 0.084	(11.40–11.52)
MC2	2	3.64 ± 0.056	(3.60–3.68)
MC3	2	2.38 ± 0.021	(2.37–2.40)
MC4	2	4.31 ± 0.007	(4.31–4.32)
MC5	2	1.83 ± 0.063	(1.79–1.88)
MC6	2	3.01 ± 0.091	(2.95–3.08)
MC7	2	1.47 ± 0.077	(1.42–1.53)
F1	2	26.75 ± 1.060	(26.00–27.50)
F2	2	7.22 ± 0.424	(6.92–7.52)
F3	2	5.96 ± 0.615	(5.53–6.40)
F4	2	2.93 ± 0.169	(2.81–3.05)
F5	2	5.49 ± 0.014	(5.48–5.50)
F6	2	2.43 ± 0.084	(2.37–2.49)
F7	2	2.80 ± 0.106	(2.73–2.88)
T1	2	28.95 ± 1.626	(27.80–30.10)
T2	2	6.18 ± 0.091	(6.12–6.25)
T3	2	4.19 ± 0.091	(4.13–4.26)
T4	2	4.10 ± 0.148	(4.00–4.21)
T5	2	2.84 ± 0.070	(2.79–2.89)
T6	2	2.41 ± 0.098	(2.34–2.48)
T7	2	2.22 ± 0.042	(2.19–2.25)
MT1	2	12.23 ± 0.374	(11.97–12.50)
MT2	2	3.18 ± 0.021	(3.17–3.20)
MT3	2	2.79 ± 0.106	(2.72–2.87)
MT4	2	4.15 ± 0.141	(4.05–4.25)
MT5	2	1.78 ± 0.120	(1.70–1.87)
MT6	2	2.46 ± 0.148	(2.36–2.57)
MT7	2	1.66 ± 0.063	(1.62–1.71)
S1	2	24.80 ± 0.848	(24.20–25.40)
Rupicapra rupicapra			
H1	7	17.41 ± 1.317	(15.80–19.60)
H2	7	19.14 ± 1.350	(17.50–21.30)
H3	7	3.31 ± 0.222	(3.09–3.74)
H4	7	3.11 ± 0.199	(2.88–3.46)
H5	7	3.37 ± 0.221	(3.02–3.76)
H6	7	1.27 ± 0.072	(1.17–1.40)
H7	7	1.61 ± 0.143	(1.43–1.87)
H8	7	2.03 ± 0.222	(1.71–2.43)
U1	7	23.32 ± 1.588	(21.40–25.60)
U2	7	4.35 ± 0.379	(3.85–4.88)
R1	7	18.65 ± 1.092	(17.40–20.10)
R2	7	3.00 ± 0.212	(2.77–3.39)
R3	7	1.67 ± 0.090	(1.54–1.80)
R4	7	3.22 ± 0.219	(2.97–3.59)
R5	7	3.04 ± 0.170	(2.79–3.36)
R6	7	1.86 ± 0.189	(1.58–2.16)
R7	7	1.12 ± 0.118	(0.91–1.29)
MC1	7	14.45 ± 1.117	(13.30–15.90)
MC2	7	2.46 ± 0.187	(2.28–2.81)
MC3	7	1.68 ± 0.087	(1.61–1.87)
MC4	7	2.78 ± 0.197	(2.55–3.08)
MC5	7	1.33 ± 0.083	(1.22–1.46)
MC6	7	1.66 ± 0.179	(1.40–1.96)
MC7	7	1.21 ± 0.119	(1.03–1.42)
F1	7	21.11 ± 1.494	(19.40–23.50)
F2	7	4.66 ± 0.264	(4.29–4.99)
F3	7	3.64 ± 0.231	(3.35–3.99)
F4	7	1.96 ± 0.131	(1.80–2.20)
F5	7	3.91 ± 0.220	(3.63–4.32)
F6	7	1.66 ± 0.264	(1.20–2.08)
F7	7	1.90 ± 0.155	(1.72–2.19)
T1	7	26.25 ± 1.660	(24.30–28.50)
T2	7	4.51 ± 0.271	(4.12–4.89)
T3	7	2.85 ± 0.201	(2.60–3.21)
T4	7	2.92 ± 0.158	(2.74–3.16)
T5	7	2.05 ± 0.159	(1.87–2.32)
T6	7	1.74 ± 0.178	(1.42–2.00)
T7	7	1.65 ± 0.155	(1.44–1.86)
MT1	7	16.25 ± 1.154	(15.10–17.80)
MT2	7	2.29 ± 0.161	(2.13–2.54)
MT3	7	2.14 ± 0.161	(1.99–2.42)
MT4	7	2.84 ± 0.228	(2.52–3.16)
MT5	7	1.36 ± 0.100	(1.22–1.48)
MT6	7	1.49 ± 0.174	(1.28–1.81)
MT7	7	1.33 ± 0.139	(1.18–1.57)
S1	4	16.25 ± 0.500	(15.70–16.90)
Budorcas taxicolor			
H1	5	29.52 ± 2.715	(25.90–32.70)
H2	5	33.26 ± 3.035	(29.50–36.80)
H3	5	6.57 ± 0.853	(5.53–7.48)
H4	5	6.25 ± 0.622	(5.46–6.88)
H5	5	6.70 ± 0.628	(5.95–7.36)
H6	5	2.62 ± 0.349	(2.14–3.02)
H7	5	3.93 ± 0.501	(3.40–4.60)
H8	5	4.70 ± 0.683	(3.84–5.69)
U1	5	37.68 ± 3.743	(33.70–41.80)
U2	5	9.43 ± 1.148	(8.25–10.64)
R1	5	27.34 ± 2.184	(24.90–29.50)
R2	5	6.29 ± 0.658	(5.50–6.99)
R3	5	3.42 ± 0.370	(2.96–3.85)
R4	5	6.48 ± 0.625	(5.73–7.08)
R5	5	6.57 ± 0.701	(5.81–7.34)
R6	5	3.70 ± 0.353	(3.34–4.18)
R7	5	2.59 ± 0.363	(2.20–3.06)
MC1	5	11.64 ± 0.835	(10.70–12.70)
MC2	5	5.37 ± 0.387	(4.90–5.78)
MC3	5	3.90 ± 1.893	(2.79–7.27)
MC4	5	5.78 ± 0.537	(5.11–6.40)
MC5	5	3.34 ± 1.925	(2.22–6.77)
MC6	5	4.82 ± 0.457	(4.34–5.31)
MC7	5	2.15 ± 0.258	(1.81–2.46)
F1	5	34.28 ± 3.211	(30.40–37.80)
F2	5	9.64 ± 1.177	(8.03–10.64)
F3	5	8.04 ± 0.820	(7.22–9.28)

APPENDIX 2—(*Continued*)

F4	5	3.61 ± 0.510	(3.22–4.20)
F5	5	7.35 ± 0.609	(6.66–7.97)
F6	5	3.56 ± 0.369	(3.17–4.10)
F7	5	3.48 ± 0.324	(3.01–3.86)
T1	5	34.30 ± 3.333	(30.20–37.80)
T2	5	8.69 ± 0.608	(7.89–9.50)
T3	5	5.10 ± 0.517	(4.39–5.75)
T4	5	5.60 ± 0.344	(5.31–6.05)
T5	5	3.58 ± 0.243	(3.25–3.91)
T6	5	3.38 ± 0.355	(3.07–3.84)
T7	5	3.01 ± 0.295	(2.68–3.37)
MT1	5	13.58 ± 0.892	(12.40–14.50)
MT2	5	4.08 ± 0.317	(3.71–4.42)
MT3	5	3.68 ± 0.226	(3.40–3.90)
MT4	5	5.12 ± 0.478	(4.51–5.61)
MT5	5	2.59 ± 0.227	(2.36–2.96)
MT6	5	3.63 ± 0.380	(3.28–4.12)
MT7	5	2.19 ± 0.210	(1.93–2.44)
S1	2	32.80 ± 2.545	(31.00–34.60)
Ovibos moschatus			
H1	7	25.10 ± 1.810	(23.10–28.20)
H2	7	28.00 ± 2.042	(25.80–31.60)
H3	7	5.89 ± 0.483	(5.16–6.50)
H4	7	6.36 ± 0.444	(5.88–6.92)
H5	7	6.24 ± 0.409	(5.81–6.77)
H6	7	2.54 ± 0.192	(2.24–2.88)
H7	7	3.38 ± 0.338	(2.93–3.83)
H8	7	4.20 ± 0.405	(3.72–4.77)
U1	7	32.58 ± 2.119	(29.60–35.80)
U2	7	8.67 ± 0.851	(7.78–9.75)
R1	7	25.02 ± 1.797	(22.80–28.10)
R2	7	6.41 ± 0.459	(5.86–7.05)
R3	7	3.54 ± 0.263	(3.24–3.80)
R4	7	6.56 ± 0.482	(5.99–7.08)
R5	7	6.52 ± 0.471	(5.97–7.11)
R6	7	3.43 ± 0.481	(2.89–4.27)
R7	7	2.13 ± 0.208	(1.86–2.42)
MC1	7	14.14 ± 1.088	(13.04–16.36)
MC2	7	4.99 ± 0.278	(4.63–5.39)
MC3	7	3.00 ± 0.248	(2.70–3.31)
MC4	7	5.77 ± 0.316	(5.37–6.27)
MC5	7	2.51 ± 0.232	(2.18–2.81)
MC6	7	3.40 ± 0.353	(3.00–4.04)
MC7	7	1.81 ± 0.236	(1.45–2.10)
F1	7	30.45 ± 1.956	(27.90–33.70)
F2	7	8.68 ± 0.687	(7.47–9.46)
F3	7	6.85 ± 0.547	(6.07–7.58)
F4	7	3.58 ± 0.347	(3.16–4.19)
F5	7	6.75 ± 0.455	(6.14–7.31)
F6	7	3.01 ± 0.337	(2.58–3.51)
F7	7	3.17 ± 0.283	(2.89–3.49)
T1	7	27.72 ± 1.935	(25.30–31.20)
T2	7	7.83 ± 0.477	(7.24–8.48)
T3	7	4.40 ± 0.363	(3.96–4.99)
T4	7	5.29 ± 0.301	(4.87–5.66)

T5	7	3.88 ± 0.494	(3.38–4.92)
T6	7	3.04 ± 0.268	(2.65–3.42)
T7	7	2.71 ± 0.258	(2.38–3.00)
MT1	7	15.54 ± 1.163	(14.29–17.52)
MT2	7	3.92 ± 0.169	(3.68–4.12)
MT3	7	3.86 ± 0.160	(3.66–4.07)
MT4	7	5.35 ± 0.248	(5.08–5.80)
MT5	7	2.49 ± 0.211	(2.14–2.73)
MT6	7	2.60 ± 0.213	(2.28–2.93)
MT7	7	2.21 ± 0.216	(1.90–2.51)
S1	6	31.15 ± 2.575	(27.70–34.00)
Hemitragus jehmlahicus			
H1	5	18.52 ± 1.366	(17.00–19.80)
H2	5	21.00 ± 1.516	(19.40–22.40)
H3	5	4.29 ± 0.279	(4.09–4.78)
H4	5	3.86 ± 0.154	(3.66–3.98)
H5	5	4.04 ± 0.202	(3.83–4.24)
H6	5	1.38 ± 0.030	(1.37–1.44)
H7	5	2.09 ± 0.131	(1.95–2.28)
H8	5	2.83 ± 0.203	(2.65–3.14)
U1	5	22.88 ± 1.323	(21.50–24.60)
U2	5	5.54 ± 0.508	(5.05–6.12)
R1	5	17.26 ± 0.907	(16.40–18.30)
R2	5	3.88 ± 0.161	(3.72–4.08)
R3	5	1.85 ± 0.094	(1.75–1.94)
R4	5	4.22 ± 0.187	(4.02–4.42)
R5	5	3.81 ± 0.261	(3.51–4.16)
R6	5	2.60 ± 0.205	(2.35–2.84)
R7	5	1.43 ± 0.045	(1.36–1.48)
MC1	5	12.04 ± 0.433	(11.40–12.40)
MC2	5	2.99 ± 0.137	(2.87–3.21)
MC3	5	1.80 ± 0.073	(1.74–1.89)
MC4	5	3.14 ± 0.112	(2.98–3.24)
MC5	5	1.42 ± 0.028	(1.38–1.45)
MC6	5	2.20 ± 0.188	(2.01–2.45)
MC7	5	1.34 ± 0.065	(1.27–1.41)
F1	5	23.06 ± 1.173	(21.80–24.60)
F2	5	6.05 ± 0.353	(5.58–6.53)
F3	5	4.54 ± 0.256	(4.35–4.99)
F4	5	2.45 ± 0.252	(2.14–2.76)
F5	5	4.65 ± 0.179	(4.38–4.78)
F6	5	2.15 ± 0.087	(2.01–2.24)
F7	5	2.33 ± 0.132	(2.12–2.45)
T1	5	25.16 ± 1.370	(23.50–26.90)
T2	5	5.27 ± 0.234	(5.02–5.61)
T3	5	3.28 ± 0.170	(3.03–3.50)
T4	5	3.34 ± 0.130	(3.21–3.53)
T5	5	2.47 ± 0.046	(2.41–2.53)
T6	5	2.20 ± 0.151	(2.06–2.38)
T7	5	2.08 ± 0.180	(1.86–2.32)
MT1	5	12.80 ± 0.574	(12.00–13.50)
MT2	5	2.52 ± 0.146	(2.39–2.76)
MT3	5	2.35 ± 0.063	(2.27–2.44)
MT4	5	3.02 ± 0.130	(2.86–3.18)
MT5	5	1.43 ± 0.029	(1.40–1.48)

APPENDIX 2—(*Continued*)

MT6	5	1.81 ± 0.101	(1.72–1.94)
MT7	5	1.47 ± 0.070	(1.40–1.57)
S1	4	20.50 ± 1.741	(18.90–22.20)

Capra ibex

H1	10	19.66 ± 1.658	(16.60–21.30)
H2	10	22.40 ± 2.002	(18.70–24.50)
H3	10	4.55 ± 0.422	(3.94–5.14)
H4	10	4.21 ± 0.355	(3.53–4.54)
H5	10	4.48 ± 0.451	(3.60–4.97)
H6	10	1.50 ± 0.161	(1.27–1.84)
H7	10	2.44 ± 0.249	(2.06–2.81)
H8	10	3.09 ± 0.363	(2.44–3.50)
U1	10	27.37 ± 2.747	(22.60–30.80)
U2	10	6.55 ± 0.838	(5.17–7.40)
R1	10	21.12 ± 2.111	(17.40–24.00)
R2	10	4.23 ± 0.394	(3.51–4.67)
R3	10	2.24 ± 0.266	(1.74–2.51)
R4	10	4.57 ± 0.429	(3.75–5.01)
R5	10	4.35 ± 0.552	(3.38–5.36)
R6	10	2.91 ± 0.393	(2.21–3.35)
R7	10	1.58 ± 0.238	(1.26–1.92)
MC1	10	14.51 ± 1.104	(12.80–15.70)
MC2	10	3.37 ± 0.323	(2.66–3.71)
MC3	10	2.22 ± 0.224	(1.81–2.45)
MC4	10	3.50 ± 0.336	(2.83–3.87)
MC5	10	1.73 ± 0.182	(1.38–1.92)
MC6	10	2.31 ± 0.302	(1.87–2.75)
MC7	10	1.64 ± 0.169	(1.39–1.83)
F1	10	25.24 ± 2.250	(21.00–27.40)
F2	10	6.58 ± 0.761	(5.30–7.61)
F3	10	4.87 ± 0.525	(3.91–5.54)
F4	10	2.45 ± 0.304	(1.95–2.88)
F5	10	4.93 ± 0.484	(4.00–5.52)
F6	10	2.39 ± 0.241	(2.01–2.68)
F7	10	2.48 ± 0.228	(2.13–2.77)
T1	10	29.67 ± 2.694	(25.00–33.60)
T2	10	5.73 ± 0.539	(4.71–6.41)
T3	10	3.67 ± 0.462	(2.92–4.28)
T4	10	3.55 ± 0.297	(2.96–3.88)
T5	10	2.62 ± 0.241	(2.21–2.95)
T6	10	2.34 ± 0.238	(2.00–2.62)
T7	10	2.30 ± 0.289	(1.83–2.69)
MT1	10	15.55 ± 1.304	(13.80–17.30)
MT2	10	2.73 ± 0.227	(2.21–3.06)
MT3	10	2.60 ± 0.237	(2.26–2.86)
MT4	10	3.38 ± 0.260	(2.85–3.79)
MT5	10	1.63 ± 0.150	(1.38–1.82)
MT6	10	1.88 ± 0.192	(1.60–2.12)
MT7	10	1.77 ± 0.176	(1.51–1.97)
S1	8	21.75 ± 2.150	(18.20–24.10)

Capra hircus aegarus

H1	1	13.60	MC7	1	1.11
H2	1	15.60	F1	1	17.80
H3	1	3.11	F2	1	4.57
H4	1	2.84	F3	1	3.59
H5	1	3.05	F4	1	1.58
H6	1	1.06	F5	1	3.41
H7	1	1.60	F6	1	1.63
H8	1	2.06	F7	1	1.58
U1	1	19.30	T1	1	20.80
U2	1	4.18	T2	1	3.95
R1	1	15.00	T3	1	2.51
R2	1	2.77	T4	1	2.49
R3	1	1.41	T5	1	1.86
R4	1	3.00	T6	1	1.51
R5	1	2.92	T7	1	1.40
R6	1	1.83	MT1	1	11.20
R7	1	1.29	MT2	1	1.84
MC1	1	10.50	MT3	1	1.77
MC2	1	2.36	MT4	1	2.67
MC3	1	1.55	MT5	1	1.37
MC4	1	2.39	MT6	1	1.25
MC5	1	1.17	MT7	1	1.20
MC6	1	1.61	S1	1	14.80

Capra caucasica

H1	1	20.90	MC7	1	1.68
H2	1	23.20	F1	1	26.40
H3	1	4.69	F2	1	7.26
H4	1	4.46	F3	1	5.02
H5	1	4.86	F4	1	2.66
H6	1	1.60	F5	1	5.01
H7	1	2.71	F6	1	2.56
H8	1	3.35	F7	1	2.90
U1	1	27.90	T1	1	30.60
U2	1	7.14	T2	1	6.02
R1	1	20.90	T3	1	4.17
R2	1	4.45	T4	1	3.65
R3	1	2.25	T5	1	2.56
R4	1	4.90	T6	1	2.62
R5	1	4.52	T7	1	2.54
R6	1	3.02	MT1	1	15.40
R7	1	1.67	MT2	1	2.81
MC1	1	13.90	MT3	1	2.67
MC2	1	3.53	MT4	1	3.55
MC3	1	2.46	MT5	1	1.71
MC4	1	3.62	MT6	1	2.06
MC5	1	1.78	MT7	1	1.90
MC6	1	2.51	S1	0	

Capra pyrenaica

H1	2	17.45 ± 0.212	(17.30–17.60)
H2	2	19.85 ± 0.212	(19.70–20.00)
H3	2	4.12 ± 0.070	(4.07–4.17)
H4	2	3.94 ± 0.021	(3.93–3.96)
H5	2	4.41 ± 0.049	(4.38–4.45)
H6	2	1.40 ± 0.091	(1.34–1.47)
H7	2	2.08 ± 0.056	(2.04–2.12)

APPENDIX 2—(*Continued*)

H8	2	2.73 ± 0.014	(2.72–2.74)
U1	2	24.10 ± 0.282	(23.90–24.30)
U2	2	5.70 ± 0.318	(5.48–5.93)
R1	2	18.50 ± 0.000	(18.50–18.50)
R2	2	3.94 ± 0.035	(3.92–3.97)
R3	2	1.96 ± 0.000	(1.96–1.96)
R4	2	4.43 ± 0.035	(4.41–4.46)
R5	2	3.79 ± 0.070	(3.74–3.84)
R6	2	2.45 ± 0.042	(2.42–2.48)
R7	2	1.33 ± 0.056	(1.29–1.37)
MC1	2	12.50 ± 0.282	(12.30–12.70)
MC2	2	3.07 ± 0.063	(3.03–3.12)
MC3	2	1.97 ± 0.113	(1.89–2.05)
MC4	2	3.31 ± 0.098	(3.24–3.38)
MC5	2	1.57 ± 0.007	(1.57–1.58)
MC6	2	2.19 ± 0.042	(2.16–2.22)
MC7	2	1.42 ± 0.028	(1.40–1.44)
F1	2	22.20 ± 0.000	(22.20–22.20)
F2	2	5.57 ± 0.120	(5.49–5.66)
F3	2	4.14 ± 0.197	(4.00–4.28)
F4	2	2.30 ± 0.014	(2.29–2.31)
F5	2	4.41 ± 0.063	(4.37–4.46)
F6	2	2.14 ± 0.021	(2.13–2.16)
F7	2	2.10 ± 0.084	(2.04–2.16)
T1	2	26.25 ± 0.212	(26.10–26.40)
T2	2	5.23 ± 0.028	(5.21–5.25)
T3	2	3.26 ± 0.007	(3.26–3.27)
T4	2	3.18 ± 0.049	(3.15–3.22)
T5	2	2.20 ± 0.007	(2.20–2.21)
T6	2	2.04 ± 0.014	(2.03–2.05)
T7	2	1.93 ± 0.070	(1.88–1.98)
MT1	2	13.45 ± 0.212	(13.30–13.60)
MT2	2	2.53 ± 0.169	(2.41–2.65)
MT3	2	2.32 ± 0.120	(2.24–2.41)
MT4	2	3.20 ± 0.021	(3.19–3.22)
MT5	2	1.49 ± 0.042	(1.46–1.52)
MT6	2	1.73 ± 0.021	(1.72–1.75)
MT7	2	1.53 ± 0.007	(1.53–1.54)
S1	2	19.20 ± 0.000	(19.20–19.20)

Capra falconeri

H1	1	14.50	MC7	1	1.20
H2	1	16.50	F1	1	17.70
H3	1	2.92	F2	1	4.90
H4	1	3.05	F3	1	3.85
H5	1	3.27	F4	1	1.67
H6	1	0.95	F5	1	3.72
H7	1	1.94	F6	1	1.71
H8	1	2.05	F7	1	1.94
U1	1	19.70	T1	1	20.70
U2	1	4.42	T2	1	4.25
R1	1	14.60	T3	1	2.78
R2	1	3.10	T4	1	2.75
R3	1	1.56	T5	1	2.06
R4	1	3.33	T6	1	1.76
R5	1	3.40	T7	1	1.66
R6	1	2.10	MT1	1	10.90
R7	1	1.30	MT2	1	1.94
MC1	1	10.70	MT3	1	1.85
MC2	1	2.59	MT4	1	2.55
MC3	1	1.48	MT5	1	1.29
MC4	1	2.81	MT6	1	1.37
MC5	1	1.25	MT7	1	1.32
MC6	1	1.71	S1	1	16.03

Pseudois nayaur

H1	3	17.63 ± 0.468	(17.10–17.99)
H2	3	19.77 ± 0.596	(19.20–20.39)
H3	3	4.05 ± 0.265	(3.79–4.32)
H4	3	3.70 ± 0.111	(3.58–3.80)
H5	3	3.76 ± 0.181	(3.62–3.97)
H6	3	1.33 ± 0.066	(1.28–1.41)
H7	3	2.14 ± 0.153	(2.01–2.31)
H8	3	2.75 ± 0.168	(2.64–2.95)
U1	3	24.67 ± 0.414	(24.40–25.15)
U2	3	5.61 ± 0.124	(5.54–5.76)
R1	3	19.04 ± 0.506	(18.50–19.50)
R2	3	3.71 ± 0.150	(3.57–3.87)
R3	3	1.87 ± 0.140	(1.74–2.02)
R4	3	3.93 ± 0.156	(3.83–4.11)
R5	3	3.70 ± 0.141	(3.58–3.86)
R6	3	2.36 ± 0.089	(2.26–2.42)
R7	3	1.36 ± 0.047	(1.33–1.42)
MC1	3	14.59 ± 0.332	(14.40–14.98)
MC2	3	2.84 ± 0.100	(2.74–2.94)
MC3	3	1.93 ± 0.133	(1.78–2.02)
MC4	3	3.06 ± 0.247	(2.89–3.35)
MC5	3	1.48 ± 0.108	(1.39–1.60)
MC6	3	2.08 ± 0.164	(1.98–2.27)
MC7	3	1.49 ± 0.077	(1.43–1.58)
F1	3	23.05 ± 0.776	(22.30–23.85)
F2	3	5.59 ± 0.295	(5.31–5.90)
F3	3	4.45 ± 0.438	(3.95–4.77)
F4	3	2.24 ± 0.076	(2.16–2.31)
F5	3	4.45 ± 0.170	(4.28–4.62)
F6	3	2.31 ± 0.135	(2.18–2.45)
F7	3	2.33 ± 0.177	(2.18–2.53)
T1	3	27.11 ± 0.494	(26.80–27.68)
T2	3	5.18 ± 0.200	(4.98–5.38)
T3	3	3.40 ± 0.238	(3.21–3.67)
T4	3	3.31 ± 0.121	(3.17–3.38)
T5	3	2.37 ± 0.075	(2.30–2.45)
T6	3	2.19 ± 0.065	(2.12–2.25)
T7	3	1.96 ± 0.070	(1.89–2.03)
MT1	3	15.77 ± 0.274	(15.60–16.09)
MT2	3	2.40 ± 0.055	(2.34–2.45)
MT3	3	2.40 ± 0.101	(2.29–2.47)
MT4	3	3.04 ± 0.185	(2.89–3.25)
MT5	3	1.47 ± 0.115	(1.37–1.60)
MT6	3	1.76 ± 0.079	(1.70–1.85)
MT7	3	1.60 ± 0.065	(1.54–1.67)
S1	2	19.83 ± 0.912	(19.19–20.48)

APPENDIX 2—(*Continued*)

Ammotragus lervia

H1	3	16.66 ± 2.650	(13.70–18.80)
H2	3	18.56 ± 2.968	(15.30–21.10)
H3	3	3.56 ± 0.636	(2.84–4.05)
H4	3	3.60 ± 0.659	(2.88–4.17)
H5	3	3.81 ± 0.882	(2.87–4.62)
H6	3	1.33 ± 0.191	(1.12–1.49)
H7	3	1.96 ± 0.413	(1.62–2.42)
H8	3	2.46 ± 0.608	(1.99–3.15)
U1	3	24.40 ± 3.651	(20.70–28.00)
U2	3	5.13 ± 0.839	(4.48–6.08)
R1	3	18.83 ± 0.2695	(15.90–21.20)
R2	3	3.60 ± 0.735	(2.79–4.22)
R3	3	1.81 ± 0.361	(1.44–2.16)
R4	3	3.78 ± 0.655	(3.12–4.43)
R5	3	3.50 ± 0.571	(3.01–4.13)
R6	3	2.07 ± 0.421	(1.68–2.52)
R7	3	1.29 ± 0.295	(1.01–1.60)
MC1	3	14.03 ± 1.001	(12.90–14.80)
MC2	3	2.69 ± 0.552	(2.10–3.19)
MC3	3	1.72 ± 0.388	(1.41–2.16)
MC4	3	2.74 ± 0.532	(2.16–3.20)
MC5	3	1.50 ± 0.175	(1.37–1.70)
MC6	3	1.69 ± 0.335	(1.37–2.04)
MC7	3	1.28 ± 0.245	(1.05–1.54)
F1	3	21.50 ± 2.535	(18.60–23.30)
F2	3	5.60 ± 1.287	(4.28–6.85)
F3	3	4.35 ± 0.712	(3.55–4.90)
F4	3	2.14 ± 0.361	(1.73–2.40)
F5	3	4.20 ± 0.748	(3.40–4.88)
F6	3	2.08 ± 0.256	(1.80–2.30)
F7	3	2.15 ± 0.398	(1.83–2.60)
T1	3	24.70 ± 2.264	(22.30–26.80)
T2	3	4.85 ± 0.839	(3.97–5.64)
T3	3	3.11 ± 0.775	(2.35–3.90)
T4	3	3.05 ± 0.457	(2.63–3.54)
T5	3	2.30 ± 0.315	(1.99–2.62)
T6	3	1.90 ± 0.392	(1.54–2.32)
T7	3	1.67 ± 0.372	(1.28–2.02)
MT1	3	14.70 ± 0.600	(14.10–15.30)
MT2	3	2.24 ± 0.312	(1.90–2.51)
MT3	3	2.21 ± 0.247	(1.93–2.39)
MT4	3	2.79 ± 0.552	(2.20–3.29)
MT5	3	1.50 ± 0.172	(1.38–1.70)
MT6	3	1.52 ± 0.307	(1.26–1.86)
MT7	3	1.37 ± 0.237	(1.12–1.59)
S1	1	22.30	

Ovis musimon

H1	1	14.30	MC7	1	1.20
H2	1	16.00	F1	1	18.50
H3	1	3.26	F2	1	4.54
H4	1	3.02	F3	1	3.29
H5	1	3.11	F4	1	1.87
H6	1	1.14	F5	1	3.70
H7	1	1.76	F6	1	1.86
H8	1	2.14	F7	1	1.89
U1	1	21.40	T1	1	22.90
U2	1	4.91	T2	1	4.25
R1	1	16.60	T3	1	2.60
R2	1	3.09	T4	1	2.81
R3	1	1.64	T5	1	2.09
R4	1	3.38	T6	1	1.70
R5	1	3.29	T7	1	1.62
R6	1	1.99	MT1	1	15.00
R7	1	1.04	MT2	1	2.16
MC1	1	14.00	MT3	1	2.10
MC2	1	2.43	MT4	1	2.42
MC3	1	1.72	MT5	1	1.27
MC4	1	2.31	MT6	1	1.40
MC5	1	1.36	MT7	1	1.32
MC6	1	1.61	S1	1	16.40

Ovis orientalis

H1	10	15.05 ± 1.169	(13.70–17.42)
H2	10	17.00 ± 1.298	(15.40–19.43)
H3	10	3.36 ± 0.374	(2.78–4.03)
H4	10	3.17 ± 0.277	(2.74–3.67)
H5	10	3.29 ± 0.311	(2.73–3.80)
H6	10	1.19 ± 0.139	(0.90–1.39)
H7	10	1.69 ± 0.186	(1.47–2.06)
H8	10	2.19 ± 0.266	(1.87–2.66)
U1	10	23.19 ± 1.902	(20.50–25.95)
U2	10	5.04 ± 0.522	(4.15–5.89)
R1	10	18.20 ± 1.376	(16.40–20.38)
R2	10	3.19 ± 0.251	(2.83–3.73)
R3	10	1.65 ± 0.127	(1.43–1.86)
R4	10	3.49 ± 0.302	(3.05–4.11)
R5	10	3.13 ± 0.320	(2.64–3.79)
R6	10	1.91 ± 0.211	(1.54–2.26)
R7	10	1.13 ± 0.162	(0.92–1.44)
MC1	10	16.20 ± 0.966	(14.70–17.58)
MC2	10	2.50 ± 0.186	(2.14–2.86)
MC3	10	1.69 ± 0.175	(1.45–2.00)
MC4	10	2.51 ± 0.194	(2.19–2.92)
MC5	10	1.37 ± 0.138	(1.19–1.66)
MC6	10	1.55 ± 0.168	(1.39–1.94)
MC7	10	1.30 ± 0.114	(1.17–1.50)
F1	10	20.39 ± 1.553	(18.30–23.00)
F2	10	4.88 ± 0.581	(3.76–5.71)
F3	10	3.95 ± 0.425	(3.49–4.85)
F4	10	1.98 ± 0.160	(1.65–2.19)
F5	10	3.73 ± 0.275	(3.30–4.18)
F6	10	1.87 ± 0.186	(1.48–2.14)
F7	10	1.84 ± 0.182	(1.57–2.17)
T1	10	24.71 ± 1.693	(22.60–27.32)
T2	10	4.43 ± 0.320	(3.76–4.85)
T3	10	3.00 ± 0.308	(2.56–3.72)
T4	10	2.80 ± 0.246	(2.30–3.21)
T5	10	2.11 ± 0.152	(1.79–2.31)
T6	10	1.75 ± 0.161	(1.57–2.09)

APPENDIX 2—(*Continued*)

T7	10	1.70 ± 0.189	(1.46–1.95)
MT1	10	17.34 ± 1.080	(16.00–18.95)
MT2	10	2.16 ± 0.183	(1.87–2.53)
MT3	10	2.21 ± 0.204	(1.94–2.62)
MT4	10	2.50 ± 0.205	(2.17–2.86)
MT5	10	1.31 ± 0.122	(1.13–1.57)
MT6	10	1.37 ± 0.134	(1.22–1.68)
MT7	10	1.37 ± 0.109	(1.21–1.57)
S1	7	17.03 ± 1.208	(15.50–18.61)

Ovis ammon hodgsoni

H1	2	22.25 ± 0.777	(21.70–22.80)
H2	2	25.10 ± 0.424	(24.80–25.40)
H3	2	5.28 ± 0.219	(5.13–5.44)
H4	2	4.92 ± 0.282	(4.72–5.12)
H5	2	5.28 ± 0.134	(5.19–5.38)
H6	2	2.07 ± 0.169	(1.95–2.19)
H7	2	2.69 ± 0.169	(2.57–2.81)
H8	2	3.69 ± 0.346	(3.45–3.94)
U1	2	34.90 ± 0.282	(34.70–35.10)
U2	2	7.95 ± 0.509	(7.59–8.31)
R1	2	27.55 ± 0.353	(27.30–27.80)
R2	2	4.98 ± 0.403	(4.70–5.27)
R3	2	2.63 ± 0.208	(2.61–2.65)
R4	2	5.62 ± 0.431	(5.32–5.93)
R5	2	5.12 ± 0.219	(4.97–5.28)
R6	2	3.02 ± 0.318	(2.80–3.25)
R7	2	1.69 ± 0.077	(1.64–1.75)
MC1	2	22.75 ± 0.919	(22.10–23.40)
MC2	2	3.75 ± 0.417	(3.46–4.05)
MC3	2	2.53 ± 0.240	(2.36–2.70)
MC4	2	3.83 ± 0.395	(3.55–4.11)
MC5	2	2.05 ± 0.219	(1.90–2.21)
MC6	2	2.30 ± 0.311	(2.08–2.52)
MC7	2	1.94 ± 0.219	(1.79–2.10)
F1	2	29.85 ± 0.494	(29.50–30.20)
F2	2	7.70 ± 0.523	(7.33–8.07)
F3	2	5.29 ± 0.183	(5.16–5.42)
F4	2	3.15 ± 0.205	(3.01–3.30)
F5	2	5.84 ± 0.240	(5.67–6.01)
F6	2	2.96 ± 0.091	(2.90–3.03)
F7	2	2.78 ± 0.070	(2.73–2.83)
T1	2	35.25 ± 0.212	(35.10–35.40)
T2	2	6.71 ± 0.247	(6.54–6.89)
T3	2	4.39 ± 0.388	(4.12–4.67)
T4	2	4.36 ± 0.226	(4.20–4.52)
T5	2	3.21 ± 0.091	(3.15–3.28)
T6	2	2.70 ± 0.113	(2.62–2.78)
T7	2	2.57 ± 0.247	(2.40–2.75)
MT1	2	23.80 ± 0.989	(23.10–24.50)
MT2	2	3.16 ± 0.205	(3.02–3.31)
MT3	2	3.20 ± 0.289	(3.00–3.41)
MT4	2	3.64 ± 0.353	(3.39–3.89)
MT5	2	1.96 ± 0.268	(1.77–2.15)
MT6	2	2.01 ± 0.296	(1.80–2.22)
MT7	2	2.14 ± 0.311	(1.92–2.36)
S1	0		

Ovis ammon mongolica

H1	1	19.30	MC7	1	1.79
H2	1	21.80	F1	1	26.40
H3	1	4.53	F2	1	7.41
H4	1	4.38	F3	1	4.92
H5	1	4.56	F4	1	2.88
H6	1	1.52	F5	1	4.95
H7	1	2.29	F6	1	2.52
H8	1	3.20	F7	1	2.46
U1	1	31.80	T1	1	31.30
U2	1	6.79	T2	1	6.02
R1	1	24.60	T3	1	3.94
R2	1	4.61	T4	1	4.03
R3	1	2.36	T5	1	2.76
R4	1	4.85	T6	1	2.48
R5	1	4.48	T7	1	2.31
R6	1	2.59	MT1	1	22.10
R7	1	1.77	MT2	1	2.86
MC1	1	21.30	MT3	1	2.98
MC2	1	3.40	MT4	1	3.26
MC3	1	2.25	MT5	1	1.70
MC4	1	3.44	MT6	1	1.84
MC5	1	1.76	MT7	1	1.90
MC6	1	2.00	S1	0	

Ovis ammon poli

H1	11	20.95 ± 0.964	(18.30–21.80)
H2	11	23.51 ± 1.037	(20.70–24.70)
H3	11	4.91 ± 0.283	(4.35–5.21)
H4	11	4.55 ± 0.212	(4.03–4.79)
H5	11	4.81 ± 0.204	(4.31–5.10)
H6	11	1.68 ± 0.121	(1.42–1.84)
H7	11	2.50 ± 0.206	(2.04–2.76)
H8	11	3.34 ± 0.238	(2.74–3.59)
U1	11	32.30 ± 1.778	(27.70–34.20)
U2	11	7.26 ± 0.471	(6.06–7.74)
R1	11	25.32 ± 1.334	(21.90–26.80)
R2	11	4.57 ± 0.222	(4.05–4.85)
R3	11	2.37 ± 0.130	(2.15–2.58)
R4	11	4.94 ± 0.192	(4.42–5.09)
R5	11	4.62 ± 0.262	(3.91–4.87)
R6	11	2.91 ± 0.230	(2.34–3.20)
R7	11	1.61 ± 0.141	(1.29–1.80)
MC1	11	21.10 ± 1.140	(18.60–22.70)
MC2	11	3.54 ± 0.145	(3.20–3.73)
MC3	11	2.39 ± 0.101	(2.12–2.48)
MC4	11	3.66 ± 0.193	(3.20–3.92)
MC5	11	1.98 ± 0.135	(1.69–2.12)
MC6	11	2.30 ± 0.141	(1.99–2.46)
MC7	11	1.86 ± 0.145	(1.49–1.99)
F1	11	28.21 ± 1.263	(24.90–29.50)
F2	11	7.35 ± 0.430	(6.24–7.75)

APPENDIX 2—(*Continued*)

F3	11	5.26 ± 0.288	(4.61–5.67)
F4	11	2.87 ± 0.139	(2.55–3.05)
F5	11	5.24 ± 0.195	(4.82–5.55)
F6	11	2.49 ± 0.142	(2.28–2.69)
F7	11	2.75 ± 0.200	(2.21–2.96)
T1	11	33.37 ± 1.637	(29.00–35.10)
T2	11	6.20 ± 0.212	(5.64–6.40)
T3	11	4.06 ± 0.240	(3.51–4.37)
T4	11	3.97 ± 0.171	(3.54–4.20)
T5	11	2.92 ± 0.106	(2.65–3.03)
T6	11	2.54 ± 0.148	(2.15–2.70)
T7	11	2.32 ± 0.137	(1.99-2.47)
MT1	11	22.35 ± 1.114	(19.70–23.40)
MT2	11	3.01 ± 0.099	(2.81–3.17)
MT3	11	3.05 ± 0.138	(2.75–3.20)
MT4	11	3.52 ± 0.155	(3.11–3.72)
MT5	11	1.92 ± 0.142	(1.68–2.10)
MT6	11	2.06 ± 0.112	(1.81–2.20)
MT7	11	2.03 ± 0.136	(1.68–2.18)
S1	7	26.21 ± 0.536	(25.30–27.10)
Ovis dalli			
H1	8	18.81 ± 1.205	(16.40–20.30)
H2	8	21.05 ± 1.245	(18.60–22.40)
H3	8	4.38 ± 0.299	(3.76–4.67)
H4	8	3.92 ± 0.201	(3.49–4.18)
H5	8	4.24 ± 0.254	(3.74–4.48)
H6	8	1.54 ± 0.084	(1.41–1.71)
H7	8	2.15 ± 0.163	(1.81–2.36)
H8	8	2.83 ± 0.208	(2.39–3.02)
U1	8	27.23 ± 1.783	(23.60–29.30)
U2	8	6.11 ± 0.370	(5.24–6.35)
R1	8	21.08 ± 1.335	(18.50–22.70)
R2	8	3.92 ± 0.165	(3.57–4.08)
R3	8	1.99 ± 0.095	(1.88–2.11)
R4	8	4.28 ± 0.174	(3.94–4.55)
R5	8	3.95 ± 0.210	(3.48–4.15)
R6	8	2.49 ± 0.165	(2.14–2.67)
R7	8	1.34 ± 0.079	(1.20–1.47)
MC1	8	17.39 ± 0.815	(15.90–18.40)
MC2	8	3.12 ± 0.107	(2.89–3.25)
MC3	8	1.99 ± 0.113	(1.85–2.15)
MC4	8	3.17 ± 0.111	(2.93–3.32)
MC5	8	1.60 ± 0.076	(1.43–1.68)
MC6	8	1.95 ± 0.098	(1.78–2.11)
MC7	8	1.51 ± 0.112	(1.27–1.65)
F1	8	25.03 ± 1.374	(22.50–26.50)
F2	8	6.07 ± 0.296	(5.53–6.36)
F3	8	4.55 ± 0.301	(4.12–5.01)
F4	8	2.44 ± 0.154	(2.22–2.62)
F5	8	4.71 ± 0.203	(4.34–4.96)
F6	8	2.27 ± 0.147	(1.96–2.44)
F7	8	2.36 ± 0.157	(2.04–2.49)
T1	8	29.48 ± 1.549	(26.70–31.30)
T2	8	5.56 ± 0.285	(5.04–5.82)

T3	8	3.82 ± 0.200	(3.48–4.11)
T4	8	3.52 ± 0.147	(3.22–3.74)
T5	8	2.59 ± 0.119	(2.40–2.78)
T6	8	2.18 ± 0.112	(1.99–2.31)
T7	8	1.90 ± 0.092	(1.80–2.03)
MT1	8	19.30 ± 0.965	(17.30–20.20)
MT2	8	2.69 ± 0.157	(2.46–2.94)
MT3	8	2.64 ± 0.158	(2.41–2.92)
MT4	8	3.23 ± 0.161	(2.93–3.50)
MT5	8	1.62 ± 0.080	(1.46–1.73)
MT6	8	1.77 ± 0.103	(1.57–1.90)
MT7	8	1.69 ± 0.141	(1.38–1.82)
S1	8	21.56 ± 1.890	(17.70–23.50)
Ovis canadensis canadensis			
H1	3	18.96 ± 1.792	(16.90–20.10)
H2	3	21.33 ± 2.367	(18.60–22.70)
H3	3	4.58 ± 0.721	(3.79–5.20)
H4	3	4.00 ± 0.498	(3.43–4.33)
H5	3	4.30 ± 0.537	(3.68–4.64)
H6	3	1.54 ± 0.156	(1.41–1.73)
H7	3	2.11 ± 0.422	(1.63–2.41)
H8	3	2.88 ± 0.502	(2.31–3.23)
U1	3	27.00 ± 2.778	(23.80–28.80)
U2	3	6.02 ± 0.900	(4.99–6.66)
R1	3	20.93 ± 2.023	(18.60–22.20)
R2	3	3.98 ± 0.407	(3.51–4.22)
R3	3	2.06 ± 0.205	(1.84–2.24)
R4	3	4.28 ± 0.464	(3.76–4.64)
R5	3	3.92 ± 0.525	(3.33–4.32)
R6	3	2.43 ± 0.347	(2.03–2.66)
R7	3	1.36 ± 0.235	(1.10–1.56)
MC1	3	17.00 ± 1.743	(15.00–18.20)
MC2	3	3.19 ± 0.298	(2.85–3.39)
MC3	3	2.07 ± 0.210	(1.83–2.20)
MC4	3	3.25 ± 0.301	(2.91–3.46)
MC5	3	1.60 ± 0.085	(1.51–1.67)
MC6	3	1.95 ± 0.255	(1.66–2.13)
MC7	3	1.52 ± 0.260	(1.22–1.68)
F1	3	25.13 ± 2.281	(22.50–26.50)
F2	3	6.11 ± 0.575	(5.45–6.47)
F3	3	4.40 ± 0.613	(3.73–4.93)
F4	3	2.45 ± 0.268	(2.14–2.61)
F5	3	4.76 ± 0.537	(4.14–5.09)
F6	3	2.27 ± 0.284	(1.95–2.47)
F7	3	2.29 ± 0.302	(1.96–2.55)
T1	3	29.93 ± 3.412	(26.00–32.10)
T2	3	5.68 ± 0.583	(5.01–6.05)
T3	3	3.68 ± 0.546	(3.05–4.03)
T4	3	3.43 ± 0.390	(2.98–3.68)
T5	3	2.58 ± 0.216	(2.33–2.71)
T6	3	2.22 ± 0.317	(1.86–2.41)
T7	3	2.02 ± 0.244	(1.75–2.22)
MT1	3	18.63 ± 1.677	(16.70–19.70)
MT2	3	2.78 ± 0.298	(2.45–3.02)

APPENDIX 2—(*Continued*)

MT3	3	2.67 ± 0.196	(2.46–2.85)
MT4	3	3.35 ± 0.338	(2.97–3.60)
MT5	3	1.56 ± 0.119	(1.48–1.70)
MT6	3	1.76 ± 0.199	(1.53–1.88)
MT7	3	1.63 ± 0.198	(1.41–1.79)
S1	2	22.95 ± 0.777	(22.40–23.50)

Ovis canadensis nelsoni

H1	5	18.43 ± 0.512	(17.86–19.02)
H2	5	20.77 ± 0.504	(20.11–21.32)
H3	5	4.29 ± 0.174	(4.03–4.45)
H4	5	3.87 ± 0.124	(3.71–4.02)
H5	5	4.08 ± 0.117	(3.95–4.21)
H6	5	1.45 ± 0.111	(1.30–1.61)
H7	5	2.17 ± 0.126	(2.04–2.36)
H8	5	2.66 ± 0.110	(2.50–2.76)
U1	5	27.63 ± 1.004	(26.38–28.99)
U2	5	5.95 ± 0.209	(5.71–6.19)
R1	5	21.41 ± 0.857	(20.26–22.51)
R2	5	3.91 ± 0.135	(3.73–4.07)
R3	5	2.00 ± 0.087	(1.89–2.12)
R4	5	4.22 ± 0.078	(4.13–4.31)
R5	5	3.94 ± 0.156	(3.75–4.15)
R6	5	2.39 ± 0.077	(2.33–2.52)
R7	5	1.43 ± 0.079	(1.32–1.53)
MC1	5	17.33 ± 0.345	(16.88–17.71)
MC2	5	3.10 ± 0.152	(2.94–3.32)
MC3	5	1.99 ± 0.071	(1.94–2.10)
MC4	5	3.15 ± 0.178	(2.93–3.37)
MC5	5	1.48 ± 0.029	(1.44–1.52)
MC6	5	1.93 ± 0.095	(1.86–2.04)
MC7	5	1.48 ± 0.050	(1.44–1.55)
F1	5	24.94 ± 0.911	(23.63–25.90)
F2	5	6.20 ± 0.432	(5.73–6.58)
F3	5	4.37 ± 0.225	(4.02–4.62)
F4	5	2.37 ± 0.122	(2.26–2.51)
F5	5	4.73 ± 0.145	(4.53–4.90)
F6	5	2.27 ± 0.134	(2.09–2.44)
F7	5	2.19 ± 0.120	(2.00–2.33)
T1	5	29.31 ± 0.956	(27.84–30.30)
T2	5	5.54 ± 0.136	(5.39–5.72)
T3	5	3.58 ± 0.118	(3.46–3.75)
T4	5	3.31 ± 0.135	(3.08–3.41)
T5	5	2.61 ± 0.096	(2.46–2.72)
T6	5	2.17 ± 0.058	(2.08–2.24)
T7	5	2.01 ± 0.149	(1.84–2.19)
MT1	5	18.77 ± 0.370	(18.19–19.16)
MT2	5	2.67 ± 0.111	(2.58–2.86)
MT3	5	2.62 ± 0.175	(2.40–2.89)
MT4	5	3.05 ± 0.253	(2.77–3.31)
MT5	5	1.58 ± 0.068	(1.50–1.65)
MT6	5	1.68 ± 0.028	(1.65–1.72)
MT7	5	1.61 ± 0.075	(1.52–1.72)
S1	6	20.81 ± 1.486	(18.40–22.26)

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