
Animal remains from an 18th–19th century AD pit in the Palácio Centeno, Lisbon

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A B S T R A C T

The animal remains from Palácio Centeno indicate that the inhabitants of this 18th–19th century Palace had a varied diet that included poultry, beef, mutton, suckling pig, rabbit and seafood – probably little different from that of a present-day reasonably well-to-do Lisbon household. Several bones of turkey were identified. Remains of this American bird, while not the first recorded in Portugal; document its continued presence here. The large size of the cattle bones makes them similar to other finds of cattle bones from 15th century and a few later sites in southern Portugal and therefore corroborates the suggestion that cattle were improved after the *Reconquista*.

R E S U M O

Os restos de animais do Palácio Centeno sugerem uma dieta variada e provavelmente não muito diferente da praticada por uma família rica do século XXI em Lisboa, incluindo aves, carne de vaca, borrego, leitão, coelho e mariscos. Cinco grandes ossos de ave pertencem a peru. Apesar de não constituírem a primeira evidência deste ave do Novo Mundo em Portugal, eles significam a continuação da exploração deste ave ao longo do tempo. A dimensão dos ossos dos bovinos é bastante grande, semelhante aos restos encontrados noutras jazidas portuguesas após a Reconquista. O padrão geral do tamanho das amostras deste grupo reforça a hipótese de os Cristãos terem melhorado o gado bovino após aquele período.

Introduction

The Palácio Centeno (Campo dos Mártires da Pátria, central Lisbon), formerly known as the Palácio das Açaфatas da Rainha, was built at the end of the 17th or the beginning of the 18th century on the orders of Queen Catherine of Bragança following her return to Portugal after the death in 1685 of her husband, King Charles II of England. In 2009 and in advance of building works at this palace, a sealed pit was excavated under the direction of Maria Antónia Amaral. It contained various items of domestic rubbish such as drinking cups, chamber pots etc., dating to the 18th and 19th centuries. Also present were various fragmented faunal remains including the bones of turkey and a large variety of cattle. These are described here.

Material and methods

The remains, generally well preserved, had been recovered by hand, and most belonged to mammals, some birds, fish and marine mollusc shells. All fragments were examined. For a description of which parts of bones and teeth were recorded and counted, see Davis, 2002.

Results and discussion

Taxa found (Tables 1, 2 and 3)

The most common animals include, in decreasing order of abundance, cattle, chicken, sheep, pig and turkey. Other animals present include an equid, rabbit, dog, brown rat, partridge, duck and four species of marine molluscs – cockle, mussel, oyster and clam. The relative scarcity of some of the small animals like rabbit is probably due to a recovery bias. Several bones of the turkey, an American bird that was first introduced into Europe in the 16th century, are also present. (See below for a more detailed description of these bones.) The presence of a humerus and two skulls of Brown rat are also interesting as this animal may not have arrived in Europe, presumably by accident, from its homeland in central Asia, much before the early part of the 18th century AD (Yalden, 1999, p. 183). Some bivalve molluscs (Table 3) were also found – all belong to taxa commonly consumed in Portugal today.

Table 1. List of mammals and birds and the numbers of their bones recorded (number of PoSACs; Davis, 2002) from Palácio Centeno.

Mammal/Bird	n
Cattle	20
Sheep/Goat	9 (sheep only identified)
Pig	9
Equid	present (small fragment only)
Rabbit	1
Dog	1
Brown rat	1
Chicken	14
Turkey	4
Partridge	1
Duck	1

Table 2. Numbers of teeth and bones from the Palácio Centeno.

<i>Bone/tooth</i>	<i>F/U</i>	<i>Bos</i>	<i>C/O</i>	<i>(CAH)</i>	<i>(OVA)</i>	<i>S</i>	<i>EQ</i>	<i>ORC</i>	<i>CAF</i>	<i>RAN</i>	<i>GNP</i>	<i>MEG</i>	<i>Other</i>
dP ₄		–	–			2	–	–	–	–			
P ₄		–	–			–	–	–	–	–			
P _{3/4}		–	–			–	–	–	–	–			
M ₁		–	–			2	–	–	–	–			
M _{1/2}		–	–			–	–	–	–	–			
M ₂		–	–			–	–	–	–	–			
M ₃		–	–			–	–	–	–	–			
Mandible											–	–	
Scapula	U	–	–			1	–	–	–	–	–	–	
“	F	1	–			–	–	–	–	–	–	–	
“	?	–	–			–	–	–	–	–	–	–	
Humerus	UM	–	–			–	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	2	–			–	–	–	–	1	–	–	<i>Alectoris</i>
Radius	UM	–	–			–	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	1	–			–	–	–	–	–	–	–	
M ^o Carpal	UM	–	–			–	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	1	2	–	(2)	–	–	–	–	–	2	1	
Ischium		2	1			–	–	–	–	–	–	–	
Femur	UM	1	2			1	–	–	–	–	1	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	1	1			–	–	–	–	–	2	1	
Tibia	UM	–	1			1	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	1	–			–	–	1	1	–	2	–	<i>Anas</i>
Calcaneum	U	–	–			–	–	–	–	–	–	–	
“	F	–	–			–	–	–	–	–	–	–	
“	?	–	–			–	–	–	–	–	–	–	
Astragalus		6	–			1	–	–	–	–	–	–	
M ^o Tarsal	UM	–	–			1	–	–	–	–	1	1	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	–	2	–	(2)	–	–	–	–	–	6	1	
Phalanx I	UM	–	–			–	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	3	–			–	–	–	–	–	–	–	
Phalanx II	UM	–	–			–	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	–	–			–	–	–	–	–	–	–	
Phalanx III		1	–			–	–	–	–	–	–	–	
M ^o Podial	UM	–	–			–	–	–	–	–	–	–	
“	UE	–	–			–	–	–	–	–	–	–	
“	F	–	–			–	–	–	–	–	–	–	
Others		–	–			–	–	–	–	–	–	–	

Key: UM = unfused metaphysis, UE = unfused epiphysis, F = fused end. Taxa are as follows: Bos – cattle; C/O – sheep or goat (bones that could not be identified to species i.e., sheep or goat); CAH – goat; OVA – sheep; S – pig; EQ – equid; ORC – rabbit; CAF – dog; RAN – brown rat; GNP – probable chicken; MEG – turkey. The two caprine metacarpals and two caprine metatarsals are identified as definite sheep, none of the caprine bones and teeth could be identified as goat. Other bones include two skulls of *Rattus norvegicus*, three teleost vertebrae and a fragment of an equid proximal phalanx.

Table 3. A list of identified marine mollusc shells and their numbers (n refers to the number of valves).

Latin name	English name	Portuguese name	n
<i>Cardium</i>	Cockle	Berbigão	10
<i>Mytilus</i>	Mussel	Mexilhão	2
<i>Ostrea</i>	Oyster	Ostra	4
<i>Venerupis</i>	Clam	Amêijoa	1

The turkey bones (Figs. 1, 2 and 3)

The proximal half of a carpometacarpus, an almost complete and reasonably well preserved femur, a tibiotarsus with ends missing and two tarsometatarsi (one juvenile) without their ends, all probably belonged to turkey. Apart from their smaller size (see Table 4), these bones are all very similar to those of a modern turkey in our reference collection. Tomek and Bocheński (2009) provide a number of useful criteria, both osteometric and morphological, that enables the identification of bones of various species of domestic galliformes in Europe including those of the domestic turkey, *Meleagris gallopavo*, which was brought to Europe from the New World. The presence of this exotic species is not altogether surprising since, for example, we know of a document dated 1511, and signed by the Bishop of Valencia, that was an order for the shipment to Seville of 10 turkeys – 5 males and 5 females – for breeding purposes. And apparently by 1530, turkeys were firmly established on farms in Spain (Crawford, 1984). Turkey bones were identified in deposits excavated at Santa Clara-a-Velha in Coimbra and dated to the first half of 17th century – these being the earliest archaeological remains of this bird from Portugal (Detry & Moreno García, in preparation).

The earliest archaeological record of turkey in Britain comes from mid to late 16th century Norwich (Albarella & *alii*, 2009, p. 88) and remains of this bird were also reported from late 16th century Paris (Serjeantson, 2009, p. 290). What follows are descriptions of the five Palácio Centeno bones that help to identify them as turkey. The characters are those recommended in Tomek & Bocheński (2009).

Carpometacarpus – proximal half (Figs. 1 and 2)

The estimated proximal width is 19–20 mm, the notch in the ventral rim of the *trochlea carpalis* is fairly deep and the extensor process, although badly damaged, seems fairly narrow and certainly much narrower than that on a carpometacarpus of a modern *Tetrao urogallus* in our reference collection. The *processus intermetacarpalis* is large and rounded and is also situated sufficiently distally to allow some of the intermetacarpal space to be visible proximal to the *processus intermetacarpalis*. There is no ridge between the intermetacarpal space and the *processus pisiformis*.

Femur – near complete (Figs. 1 and 3)

Proximal end: its proximal width is c. 31 mm, there is no large opening or depression next to the *crista trochanteris*. Although the *crista* is broken on this specimen, traces of two crests are just visible. The small ‘attachment’ in the lateral side of the proximal end of the bone is elongated.



Fig. 1 A general view of bones identified as turkey from Palácio Centeno. These are from left to right: dorsal view of a carpometacarpus, posterior side of the femur, posterior side of the tibiotarsus, dorsal side of the juvenile tarsometatarsus (note the incompletely ossified proximal end) and dorsal side of the adult tarsometatarsus.

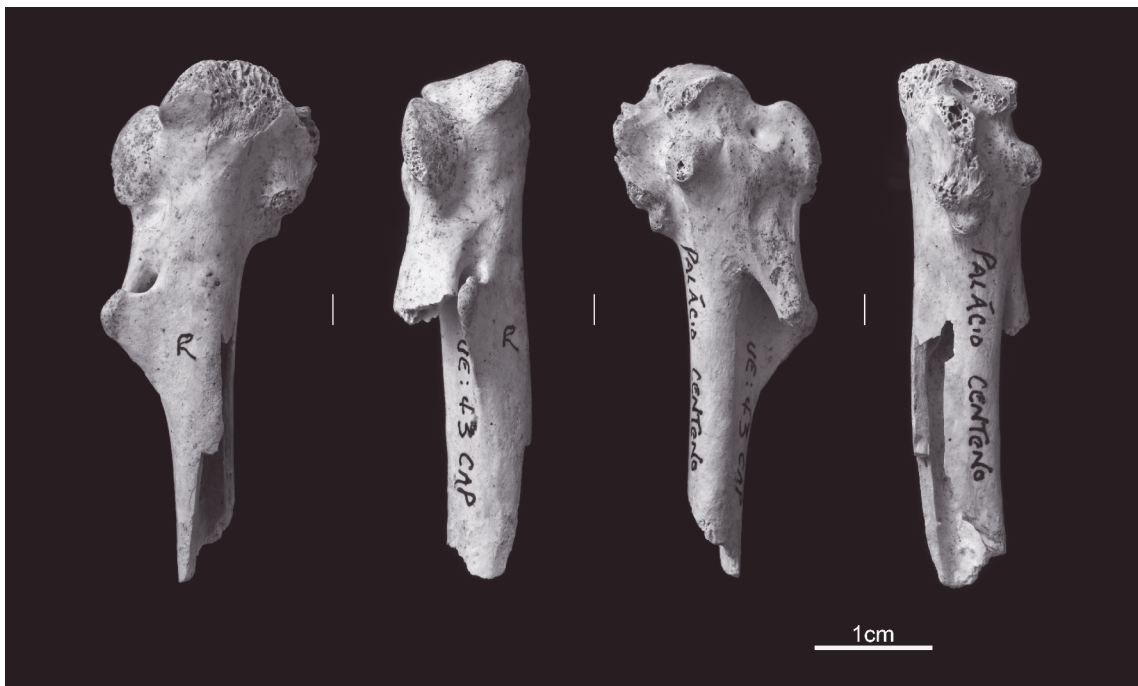


Fig. 2 The Palácio Centeno proximal half of the turkey carpometatarsus in dorsal, posterior, ventral, and anterior views.



Fig. 3 The Palácio Centeno near complete turkey femur in proximal view (above) and from left to right, posterior, lateral, anterior, and medial views, and distal view (below).

Distal end: the distal width is greater than 29 mm, the anterior edge of the medial condyle joins the shaft abruptly, and the *crista supracondylaris medialis* reaches the medial condyle. The medial condyle is approximately round and the anterior and posterior parts reach equally far proximally. The *crista supracondylaris medialis* curves towards the mid line of the shaft and does not follow its medial edge.

Tibiotarsus – shaft (Fig. 1)

This also may well have belonged to turkey on the basis of its large size.

Tarsometatarsus – two shafts without articular ends (one juvenile is incompletely ossified; Fig. 1)

On the proximal end the *sulcus extensorius* (on both specimens) runs along the middle of the shaft and forms a deep furrow in the anterior side of the shaft – the anterior surface is not flat.

On the distal part of the shaft of both specimens there is clear evidence for an opening between the trochleae of metatarsal II and III – a character not present for example in *Gallus*.

Butchery

Many of the bones showed signs of butchery such as knife and chop marks. Several large cattle bone fragments (including a humerus, scapula, four rib fragments and a femur) had clearly been sawn – presumably evidence for sophisticated butchery practises.

Parts of body represented (Table 2)

With so few bones present it is difficult to ascertain whether any particular parts of the carcass are more or less well represented. This makes it difficult to determine whether we are dealing with, for example, slaughter-house waste, or kitchen waste. For the cattle and sheep, both meat-rich and meat-poor bones are represented. It is possible that whole carcasses (or even perhaps live animals) were brought into the palace for consumption. However, the absence of any teeth of these two animals could mean they were brought in as decapitated carcasses. The pig is represented by mandibles, meat-rich bones and metapodials and so was probably brought in entire.

Age at slaughter (Table 2)

Both juvenile and adult cattle and sheep are represented, but in the case of the pig, all pig bones belonged to very young animals. The two mandibles (from the same animal) have milk teeth which show only very slight wear on their enamel with no dentine exposed suggesting an animal not more than a few weeks old when slaughtered – i.e., suckling pig or *leitão* – a dish much appreciated today in Portugal.

Animal size (Table 4 and Figs. 4, 5 and 6)

The measurements of the cattle bones are interesting – the Palácio Centeno cattle astragali are similar in size to those from several post-Moslem sites (the 15th/16th century silos in Beja; Vila Franca de Xira and Torres Vedras) and are larger than those from pre-Christian (i.e., Moslem period, Roman and Iron Age) archaeological sites in the southern part of Portugal. The two damaged humeri whose HTC (the minimum diameter of the trochlea) could be measured are also similarly very large. The large size of the Palácio Centeno cattle adds to the number of large-sized cattle bones from the few post Moslem period sites whose bones have been studied and thus corroborates the suggestion (Davis, 2008) that cattle in southern Portugal underwent a size increase – presumably signifying their improvement – under Christian rule. In contrast, the sheep metapodials (two metacarpals and two metatarsals) appear to have belonged to small animals. Their measurements fall at the bottom end of the range of measurements for these bones from 15th century AD Beja.

Table 4. Measurements in tenths of a millimetre of animal bones from Palácio Centeno.

UE	Taxon	Bone	Fusion	GL	Bd	Dd	BT	HTC	WCM	DEM	WCL	DEL	SD	Notes	English-Portuguese name
56	<i>Bos</i>	Astragalus		634		348									Cattle-Gado bovino
56	<i>Bos</i>	Astragalus		696		378									Cattle-Gado bovino
49/52	<i>Bos</i>	Astragalus		745	484	412									Cattle-Gado bovino
49/52	<i>Bos</i>	Astragalus		641	404	358									Cattle-Gado bovino
49/52	<i>Bos</i>	Astragalus		698	460	376									Cattle-Gado bovino
53	<i>Bos</i>	Astragalus			395									Bd = Est. 39-40 mm	Cattle-Gado bovino
56	<i>Bos</i>	Humerus	F					350						HTC = approx	Cattle-Gado bovino
49/52	<i>Bos</i>	Humerus	F					344						HTC = approx	Cattle-Gado bovino
49/52	<i>Bos</i>	Metacarpal	F		645	335			303	239	305	231			Cattle-Gado bovino
56	<i>Bos</i>	Tibia	F		699										Cattle-Gado bovino
39	<i>Canis familiaris</i>	Tibia	Fv		207										Dog-Cão
53	<i>Oryctolagus cuniculus</i>	Tibia	F		99										Rabbit-Coelho
56	<i>Ovis aries</i>	Metacarpal	F	1135	244	153			118	102	112	94	132		Sheep-Ovino
56	<i>Ovis aries</i>	Metacarpal	F	1150	256	159			124	102	121	96	137		Sheep-Ovino
56	<i>Ovis aries</i>	Metatarsal	F	1315	231	157							115	Bd = approx	Sheep-Ovino
49/52	<i>Ovis aries</i>	Metatarsal	F	1271	237	161							111	Bd = approx	Sheep-Ovino
39	<i>Rattus norvegicus</i>	Humerus	F	325	81			19							Brown rat-Ratazana
49/52	<i>Alectoris</i>	Humerus		458	95								43		Partridge-Perdriz
24	<i>Anas</i>	Tibio-tarsal		Est 875										GL = c. 87-88 mm	Duck-Pato
53	<i>Gallus</i>	Femur			Est 135									Bd = Est. 13-14 mm	Chicken-Galinha
39	<i>Gallus</i>	Femur		771	150	134							61	Lm = 713	Chicken-Galinha
49/52	<i>Gallus</i>	Tarsometatarsal											59	Female GL = Est. 68 mm	Chicken-Galinha
56	<i>Gallus</i>	Tarsometatarsal		755	129								59	Female	Chicken-Galinha
49/52	<i>Gallus</i>	Tarsometatarsal		708	115								53	Female	Chicken-Galinha
43	<i>Gallus/Numida</i>	Tarsometatarsal											60		?Chicken-Galinha
4	<i>Gallus/Numida</i>	Tarsometatarsal		751	134								58	GL & Bd = approx	?Chicken-Galinha
39	<i>Gallus/Numida/Phasianus</i>	Tarsometatarsal			146									Bd = approx	?Chicken-Galinha
43	<i>Gallus/Numida/Phasianus</i>	Tibio-tarsus			113	121									?Chicken-Galinha
39	<i>Meleagris gallopavo</i>	Femur		1250	288	234							125	Lm = 1138 GL = Est.	Turkey-Peru
49/52	<i>Meleagris gallopavo</i>	Tarsometatarsal											93		Turkey-Peru
56	<i>Meleagris gallopavo</i>	Tibio-tarsal											103	both ends missing	Turkey-Peru

Measurements were taken as in Driesch (1976) and metapodials and humerus as in Davis (1996).

Bones identified as '?Chicken-Galinha', probably belonged to chicken though pheasant or guinea fowl cannot be entirely excluded.

'F' = epiphysis fused, 'Fv' = epiphysis fused but suture still visible. 'UE' = archaeological context number. 'Est' = estimated measurement accurate to the nearest half millimetre.

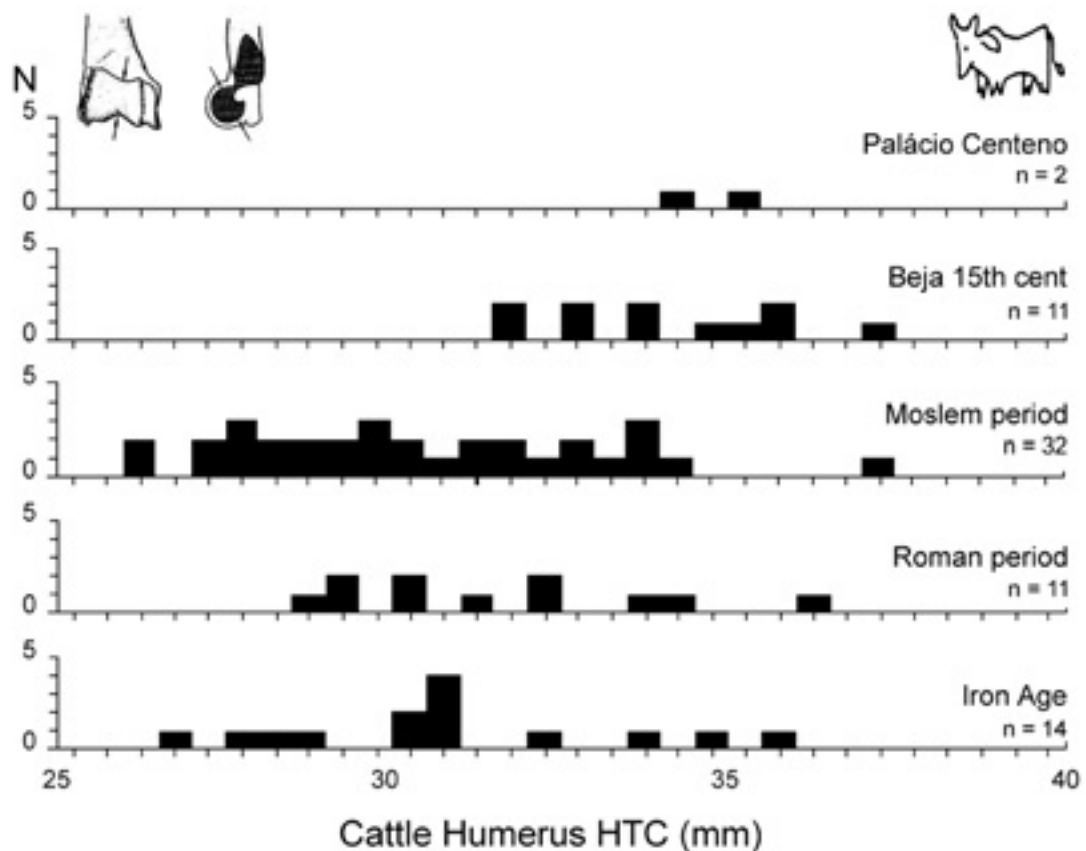


Fig. 4 The size of the Palácio Centeno cattle compared with others from the southern half of Portugal. Stacked histograms of measurements of the minimum diameter of the humerus trochlea (HTC) of pooled samples of cattle humeri from Iron Age, Roman, Moslem and 15th century AD Beja. The Palácio Centeno humeri are shown at the top. “n” refers to sample size.

► Figs. 5 and 6 The size of the Palácio Centeno cattle compared with others from the southern half of Portugal. Stacked histograms of measurements of the greatest lateral length (GLL) and the distal width (Bd) of the astragalus of aurochs (wild cattle) and cattle from Mesolithic and Neolithic sites, Chalcolithic (data from Zambujal are from Driesch & Boessneck, 1976), Iron Age, Roman, Moslem and 15th century AD Beja, as well as a few astragali from post 15th century sites. The Palácio Centeno astragali are shown as circles at the top. “n” refers to sample size. Note the very large size of the Mesolithic specimens, as well as the almost separate peak of 10 or 11 large specimens in the Chalcolithic, all presumed to have belonged to aurochs or *Bos primigenius*, the wild ancestor of cattle. The bulk of the specimens being of smaller size are presumed to have belonged to domestic cattle. Note the absence of any significant size change between Iron Age and Moslem times of these presumed domestic cattle and the subsequent increase by the 15th century AD, although these did not attain the great size of the wild aurochs. The astragalus measurements from Palácio Centeno are clearly similarly large like the other 15th century and later cattle astragali.

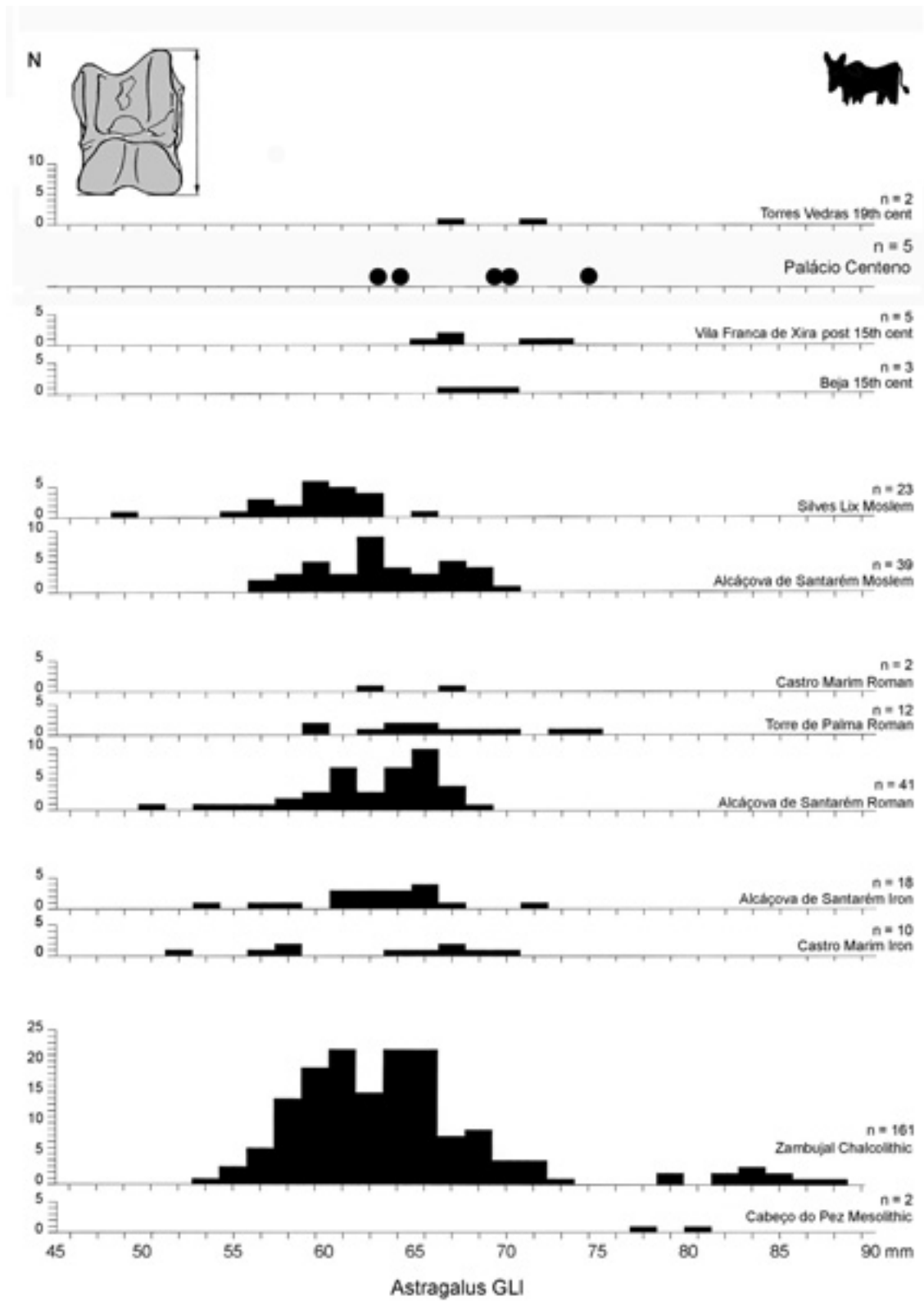


Fig. 5

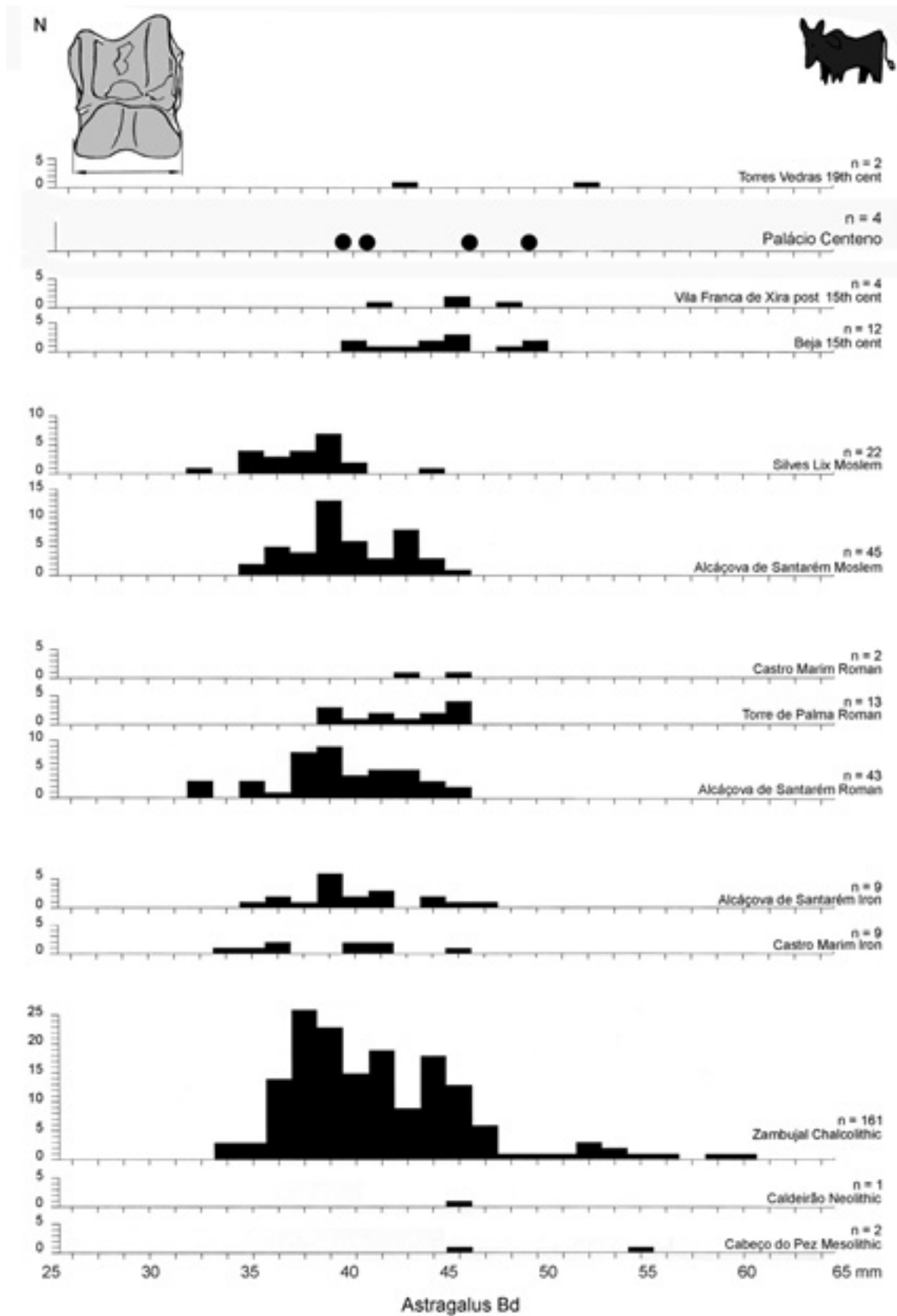


Fig. 6

Summary and conclusions

The spectrum of animal taxa from Palácio Centeno indicates the consumption of a wide variety of animals and a diet that may have been little different from that of a present-day reasonably well-to-do Lisbon household — poultry, beef, mutton, suckling pig, rabbit and seafood. The presence of a bone of dog and of an equid, probably not derived from consumed animals, may simply indicate the addition of general rubbish into the pit. The bones of turkey, while not the first recorded in Portugal, document the continued presence here of this exotic bird. The large size of the cattle bones compared with cattle bones from the few from other post-Moslem sites, most of which are large, provides additional evidence for the suggestion that cattle in the southern part of Portugal were improved after the *Reconquista*.

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