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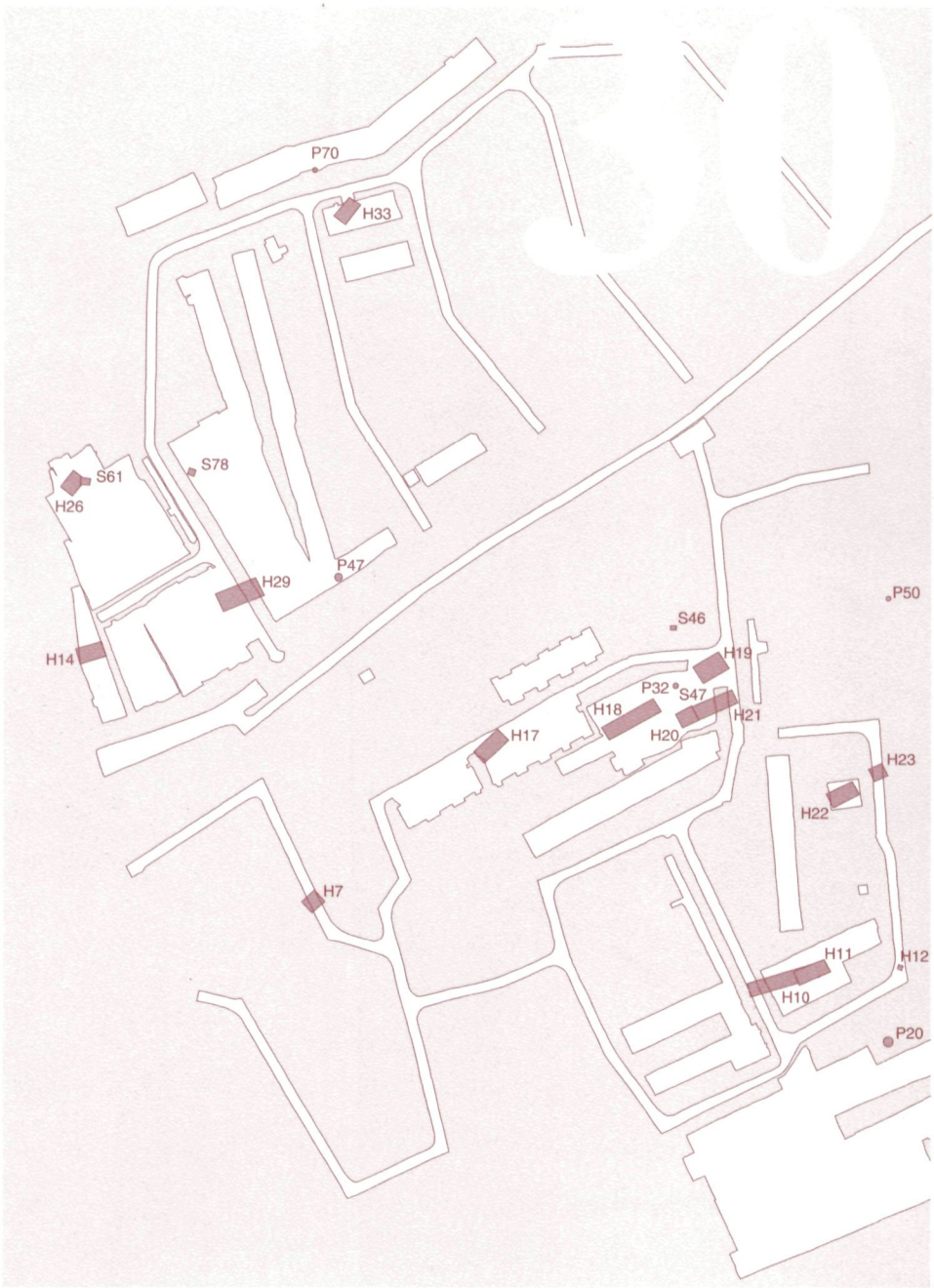

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THE USSEN PROJECT

THE FIRST DECADE OF EXCAVATIONS AT OSS

EDITED BY HARRY FOKKENS

LEIDEN UNIVERSITY 1998

To the local archaeologists who were our ears, eyes and hands:
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contents

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Livestock and meat from the Iron Age and Roman period settlements at Oss-Ussen (800 BC - AD 250)

1. Introduction

In spite of the poor preservation conditions, several thousand animal remains were collected in the excavations carried out by the Institute of Prehistory at Oss-Ussen. These animal remains have been studied with the aim of gaining insight into the role of animals and animal products in the economy and in the rituals of the occupants of Ussen between 800 BC and AD 250. Another objective was to find out whether the bones show any indications of presence of the Roman control on native stock keeping.

2. The remains and research methods

The studied remains were collected in the excavations carried out between 1976 and 1986. The majority of the almost six thousand bones and bone fragments were dated to the Iron Age (36%) and the Roman period (54%). In addition, several Middle Bronze Age and a few hundred late medieval bones were found. Besides settlement refuse, these remains include animal bones found in cemeteries and a few cult sites. The Bronze Age and Iron Age settlements and ritual structures have been discussed in detail in chapters 5-9. Van der Sanden and Van den Broeke have published a brief description of the Roman-period settlements (1987).

The quantity of animal bones is very small in comparison with the size of the excavated area. This is primarily attributable to the poor preservation conditions of the sandy soil with its low calcium content. Only bones recovered from fairly great depths, at the bottoms of wells, pits and ditches, had to some extent been preserved by the groundwater, although they, too, were in poor condition. A small proportion of the remains had survived as a result of the fact that they had been burned. Because of these conditions, far more remains had

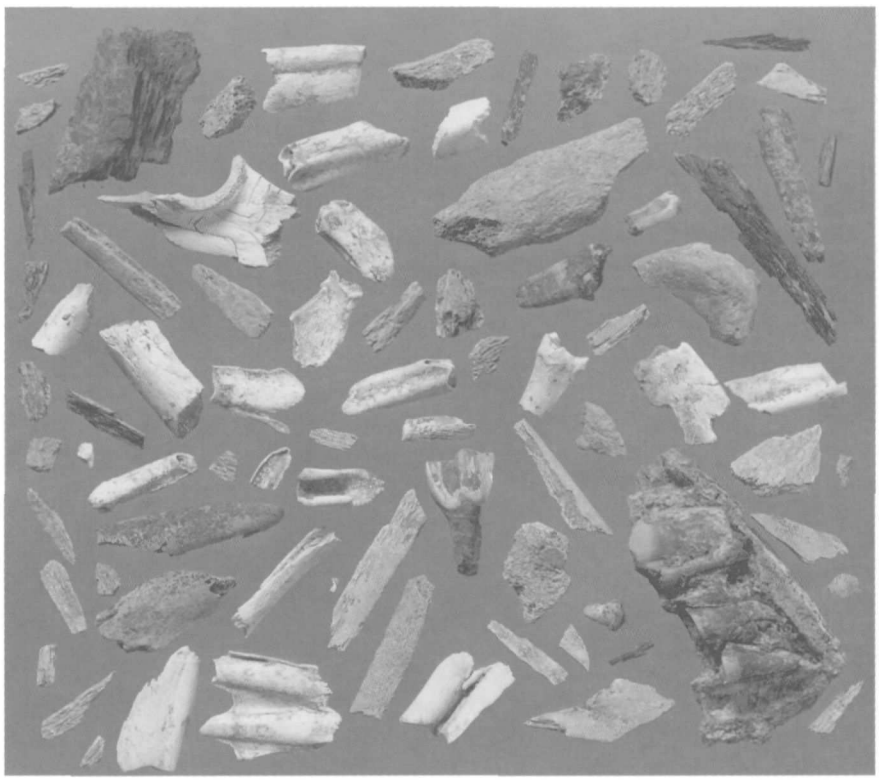

Figure 1. Severely fragmented animal bones from Oss-Ussen. Scale 1:2.

disappeared at Oss than at for example settlements in the clay region, and the bones that had survived were difficult to identify as their surfaces were worn and they were in a very fragmentary condition *(fig. 1)*. The average weight of the bone fragments is consequently no more than 5.9 grams. In determining the remains, G.F. IJzereef counted fragments that probably derived from the same skeletal elements only once, as a result of which the total number of bones included in the tables is about three thousand. It was mainly fragments of teeth and unidentifiable bones that were thus classed as deriving from the same skeletal elements.

The faunal spectra of sites with such poor preservation conditions are biased because bones of different skeletal elements are affected to varying extents. Teeth and molars, for example, survive better than vertebrae and ribs. This explains why 74 percent of the identified bones, 44 percent of the total mass, consists of dental remains. So no far-reaching conclusions can be drawn from the faunal spectrum of Oss-Ussen.

Animals with small bones, such as young mammals, birds and fish, may be underrepresented, as the excavated remains were not sieved (Clason/Prummel 1977). On the other hand, the low average bone weight shows that the bones were collected very meticulously. The fact that no fish remains whatsoever were found in the hundreds of soil samples that were taken for palaeobotanical research moreover suggests that the distortion caused by the absence of evidence from sieved samples may not be too severe after all.

There where measurements were taken of the bones, the method recommended by Von den Driesch (1976) was used. Withers heights were calculated as proposed by Von den Driesch and Boessneck (1974). The animals' ages were determined on the basis of the extent of eruption and amount of attrition of the teeth and on the extent of epiphyseal fusion of the long bones (Habermehl 1975). The bones' weights are indicated in the tables in grams.

3. Bronze Age

Indirect evidence for stock keeping at Ussen in the Middle Bronze Age is the plan of a farm unearthed in 1986 incorporating what was presumably a byre with a length of about twenty metres (Vasbinder/Fokkens 1987). Direct evidence is scarce, comprising only three teeth fragments *(table 1)*. The first, a molar from the *madibula* of a piglet, was found in well P437, which was lined with a hollowed-out tree-trunk and was probably associated with the farm lying 15 metres further south. The other two, teeth from the upper jaw of a bovine animal, were found in P448, a pit that was also dated to the Middle Bronze Age.

Table 1. Middle Bronze Age animal bones.

species	number	weigth (g)
cattle	2	8.8
pig	1	5.4
total	3	14.2

4. Iron Age

4.1. THE REMAINS

Table 2 presents a survey of the animals represented in the different phases of the Iron Age. The evidence is summarised in table 3, which also includes the remains that could be dated to the Iron Age only, without further distinction between the three phases (EIA, MIA and LIA).

Less than half of the fragments could be identified. But the weights of the bones show that the unidentifiable fragments are predominantly small, so, all in all, seventy to eighty percent of the total weight of the bones was identified.

Our interpretation of the composition of the stock may be biased owing to the fragmentary condition of the remains, because for example the bones of sheep and pigs were more fragmented than those of cattle, so a greater proportion of the former will be included among the unidentified remains. To assess the extent of this bias, we compared the data of the 'cattle/horse-sized' and 'sheep/pig-sized' categories with the data of the species groups of the same sizes whose remains were identified. If we exclude dog, bird and unidentified mammals of an unknown size, the percentage of identified large mammals (cattle/horse/red deer) dated to the Early Iron Age is 84, versus 59 percent unidentified large mammals. These figures are 95 versus 67 percent for the Middle Iron Age and 93 versus 83 percent for the Late Iron Age. This means that the large mammals, cattle, horse and theoretically also red deer, are overrepresented. The large animals are overrepresented in terms of the weight of the bone, too, although the differences between the identified and unidentified remains in terms of weight are much smaller than those in terms of numbers. The ratios of the weights of the bones from the Late Iron Age even show no differences whatsoever. Due allowance will have to be made for this bias, which is most severe in the numbers of bones, in further interpretations of the data.

The shallow pit P182 (MIA) yielded a small fragment of a burned human bone weighing three grams.

4.2. THE ANIMALS

When we refer to the animals of Ussen we are actually referring to domestic animals only. Hunting was of no importance whatsoever at these farming settlements. The rare remains of hunted animals that were found at the site derive from red deer. Pit P26 (MIA) yielded part of the *madibula* of what was probably a red deer. Of Late Iron Age date are two pieces of antler tyne (pit P470) and a burned piece of *ulna* that was found in the pit of one of the central supports of house H114.

Table 2. Animal bones from the various Iron Age phases.

	Early Iron Age				Middle Iron Age				Late Iron Age			
species	number	%	weight (g)	%	number	%	weight (g)	%	number	%	weight (g)	%
cattle	43	61	407.6	50	100	59	2589.5	75	116	72	2562.9	75
sheep/goat	1	1	0.4	0	1	1	60.0	2	4	2	21.2	1
pig	10	14	50.4	6	8	5	38.6	1	8	5	53.5	2
horse	15	21	347.8	43	59	35	761.4	22	30	19	683.0	20
dog	1	1	5.0	1	0	–	0.0	–	1	1	15.0	0
deer	0	–	0.0	–	1	1	13.5	0	3	2	62.7	2
total identified	70	*48*	811.2	*77*	169	*52*	3463.0	*83*	162	*37*	3398.3	*69*
cattle/horse size	35	47	175.3	70	90	57	610.1	85	225	83	1479.8	97
sheep/pig size	25	33	53.7	22	44	28	79.7	11	45	17	50.6	3
mammal	15	20	20.0	8	21	13	24.0	3	2	1	1.1	0
bird	0	–	0.0	–	3	2	1.0	0	0	–	0.0	–
total not identified	75	*52*	249.0	*23*	158	*48*	714.8	*17*	272	*63*	1531.5	*31*

Hunting was probably practised only sporadically, to incidentally control large game that threatened the occupants' economy, for those animals will not have spared the fields. Whether people also hunted small mammals and birds cannot be inferred from the manually collected remains. The same holds for fishing. The total absence of remains of these categories of animals from the hundreds of palaeobotanical samples however makes it unlikely that fishing and the hunting of small animals were important subsistence activities.

Even when we allow for the aforementioned bias, it is clear from tables 2 and 3 that cattle were by far the most important domestic farm animals. Next come horses, in terms of both the number of bones and their weight. From the fragmented remains, which consist largely of dental elements, it is not immediately clear whether the horses' meat was consumed. At other sites, where bones had survived in a condition allowing statements to be made on the consumption of horse meat, it has been concluded that horse meat was usually not consumed (Gautier 1990; IJzereef/Laarman/Lauwerier 1989). The sites of Velsen-Hoogovens (Van Wijngaarden-Bakker 1988: 167) and Voorne-Putten (Prummel 1989: 255) could well be exceptions in this respect, although the conclusions regarding the consumption of horse meat were in these cases based on very little evidence, notably three and seven horse bones, respectively. If we apply the common assumption to Oss-Ussen, the horses will have been kept not for consumption, but for carrying loads, for riding or for pulling carts or ploughs. Part of a simple tripartite wooden disk wheel dating from the Middle Iron Age that was found at the site shows that horse- or ox-drawn vehicles were used in farming practices (see Schinkel, this volume, fig. 89 and Van der Sanden 1987g: 94-96). Besides for practical purposes, the horses may also have been used as status symbols, as has been demonstrated at other sites (*e.g.* Müller 1991) and has been suggested for Late Bronze Age and Iron Age settlements in the western Netherlands (IJzereef/Laarman/Lauwerier 1989: 261-262). That Iron Age man's attitude towards horses and dogs differed from that towards cattle, sheep and pigs is apparent from the fact that the meat of these animals was usually not consumed. Such a taboo relating to the consumption of meat may have a religious background. It is also conceivable that people had stronger emotional bonds with these animals, which may have been seen more as companions than as farm animals. As demonstrated at other Iron Age sites, the horses were probably small. A Late Iron Age *metatarsal* with

Table 3. Iron Age animal bones.

species	number	%	weight (g)	%
cattle	288	64	6467.8	74
sheep/goat	11	2	88.3	1
pig	31	7	157.0	2
horse	111	25	1910.9	22
dog	2	0	20.0	0
deer	4	1	76.2	1
total identified	447	*44*	8720.2	*75*
cattle/horse size	396	69	2680.2	91
sheep/pig size	136	24	221.2	7
mammal	42	7	57.5	2
bird	2	0	1.0	0
total not identified	576	*56*	2959.9	*25*
total	1023		11680.1	

a length of 245 mm suggests that the animals had a withers height of about 128 cm.

Cattle was of primary importance as far as the consumption of meat was concerned. Even when we allow for the aforementioned possibility of pig and sheep/goat being underrepresented in the identified remains, it would seem that these animals were of only minor importance. At the Iron Age settlements of Haren[1] and Son en Breugel, whose animal remains were also in a very poor condition, the proportion of sheep/goat remains in particular was considerably higher (Clason 1979; Van Mensch 1980). Three of the four jaw or bone fragments of pig from which a butchering age could be inferred derived from young animals, the fourth from a three-to-four year-old animal. These are normal ages for animals that were raised primarily for their meat, for such animals reach their economic opitimum before they are physically mature. Keeping the animals alive for longer leads to a greater weight of meat and fat, but the investments in fodder, time and effort outweigh the higher yields. Some of the animals were of course kept for procreation.

The sheep will have produced wool besides meat. This is emphasised by finds of spindle whorls and loom weights (see Schinkel, this volume, *sections 6.4.2, 7.4.2* and *8.4.2*). Goats may likewise have been raised for both their meat and their milk.

There is too little reliable evidence on the ages at which the cattle were killed to allow any definitive statements on how these animals were used. The cattle of Oss-Ussen may have been raised primarily for the benefit of crop cultivation. They were certainly the most important suppliers of dung for the fields and they were capable of supplying traction for ploughing and transport. Two fragments of the jaws of animals that must have been killed at ages of 15-18 months and around 29 months could imply that some of the animals, probably bulls, were killed when they reached their full weight. Apparently the stock was large enough to be able to spare these animals as far as the production of dung was concerned. That large numbers of cattle were kept in the Iron Age is also evident from the large byres of the longhouses, some of which were almost 30 metres long in the Late Iron Age (see Schinkel, this volume, *section 8.3.1.3*). The cattle may have supplied milk, too, and, after they had died, hides, just like horses and sheep. What may be indications of dairying are the funnel-shaped earthenware vessels found at the site, which may have been cheese moulds (Van den Broeke 1987b: 104-105).

At Ussen the cattle probably formed part of a mixed farming system with a fairly heavy reliance on stock keeping. The livestock supplied the dung and traction required for crop cultivation, but there were also sufficient animals to allow cattle to be killed prematurely for their meat.

4.3. ANIMALS IN RITUAL STRUCTURES

A small portion of the animal bones discussed here was found in ritual structures. These bones could represent animals that were offered to deities, or meals intended to accompany the deceased. In view of their potentially unusual status, these remains will be discussed separately below.

The Early Iron Age burial R15 yielded an unburned fragment of a bone of a large mammal.

Another 39 grams of bone – the remains of two cattle teeth and 21 indeterminable fragments of burned bone – were found in the eastern part of the rectangular ditched enclosure of the Middle Iron Age cult site R26. A pit (P98) in the southeastern corner of this structure yielded an unburned fragment of a bone of a sheep or a pig.

The southern branch of the ditch enclosing cult site R49 contained unburned fragments of three teeth of a bovine animal and two of a pig. Two burned bird bone fragments, burned fragments of the bones of a large mammal and four unburned fragments of cattle teeth were found in the western branch of this ditch.

The ditch surrounding cult site or burial R2 yielded two unburned fragments of the bones of a sheep or pig.

Amongst the cremated remains found in burial R47 was the distal part of a *tibiotarsus* – also burned – of some fowl or pheasant-like bird (*Phasigninae*)(Lauwerier 1985).

Unburned fragments of four cattle teeth and indeterminable fragments of the bones of a large mammal were found in the northern part of the ditch of burial R8, dating from the Late Iron Age.

And, finally, fragments of burned animal bones were found in burials R9 and R19, which were dated to the Iron Age without further distinction: a fragment of the bone of a large mammal in burial R9 and part of the bone of a sheep- or pig-sized animal in burial R19.

Whether the above remains represent animals that played some part in the burial rite or other cult practices, or whether they are the remains of ordinary meals that ended up in the ditches and pits secondarily is in most cases difficult to say. This question can however be answered as far as the bird remains found in burial R47 are concerned. The cremated bones were found among the cremated human remains, so the bird was apparently burned along with the body of the deceased. The animal bones may represent a meal that was intended to accompany the deceased on his or her journey to the afterworld. Or they may be the remains of an offering that was presented to the deities as part of the burial rite.

The only other place where bird remains were found at Oss-Ussen is the ditch of cult site R49. Of course the method used to collect remains during the excavations was not suitable for obtaining information on the use of birds, but the fact that the only two concentrations of bird remains should have come to light in ritual structures suggests that birds had a special status in Iron Age society at Oss. With due reservation it could be suggested that birds, which do not seem to have formed part of the daily diet, played an more important part in a ritual context.

Table 4. Animal bones from three settlements of the Roman Period

	Vijver				Westerveld				Zomerhof			
species	number	%	weight (g)	%	number	%	weight (g)	%	number	%	weight (g)	%
cattle	17	77	279.4	91	517	67	6751.2	73	8	67	51.9	84
sheep/goat	0	–	0.0	–	25	3	98.0	1	0	–	0.0	–
pig	3	14	3.9	1	32	4	195.6	2	1	8	5.0	8
horse	0	–	0.0	–	181	24	2218.7	24	3	25	5.0	8
dog	1	5	0.3	0	12	2	40.1	0	0	–	0.0	–
deer	1	5	25.0	8	0	–	0.0	–	0	–	0.0	–
domestic fowl	0	–	0.0	–	1	0	0.9	0				
total identified	22	*81*	308.6	*97*	768	*50*	9304.5	*66*	12	*67*	61.9	*91*
cattle/horse size	3	60	5.7	53	666	87	4630.6	95	6	100	6.3	100
sheep/pig size	0	–	0.0	–	65	8	92.3	2	0	–	0.0	–
mammal	2	40	5.0	47	38	5	170.0	3	0	–	0.0	–
total not identified	5	*19*	10.7	*3*	769	*50*	4892.9	*34*	6	*33*	6.3	*9*
total	27		319.3		1537		14197.4		18		68.2	

5. The Roman period

5.1. THE REMAINS

Tables 4 and 5 present surveys of the faunal remains dating from the Roman period. Not included in the tables are the previously investigated burned remains of animals that were found in five cremation burials (Lauwerier 1985).

Although animal bones were found at three settlements, the amounts found at the Vijver and Zomerhof settlements are so small that there is little sense in discussing them separately. The Roman-period remains will therefore be discussed in their entirety below, as summarised in table 5.

About half of the remains, 66 percent of the total weight, could be identified to species. Unlike with the Iron Age remains, there is no difference in the large/small animal ratios between the identified and unidentified remains.

5.2. THE ANIMALS

In the Roman period, too, hunting was of no importance whatsoever for the economy. Only the Vijver settlement yielded part of an antler tyne of a red deer. But even this need not point to hunting, as it could derive from a shed antler taken home by one of the occupants.

Horses and dogs were on the whole rarely consumed anywhere in the Roman period (Luff 1982; Lauwerier/Robeerst in press.). This has for example been demonstrated for the eastern rivers area a little further to the north on the basis of evidence like frequencies and positions of cuts and hacking marks and the degree of fragmentation of the bones (Lauwerier 1988). Although there is no sense in attempting to analyse such features in the case of the bones found at Oss, we assume that the occupants of this site were no exception to the rule, and that they did not consume horse or dog meat either. Horses will have been used only for riding or for pulling carts or ploughs or carrying moderately heavy loads. As in Nijmegen and its surroundings (Lauwerier 1988), the animals were most probably skinned for their hides after they had died. The bones of young animals that were found among the faunal remains suggest that the occupants of the farms bred their horses themselves.

Although we must be very careful in making any quantitative statements in view of the poor condition of the bones, cattle seem to have been by far the most important animals as far as the consumption of meat is concerned. Sheep and pigs were of much lesser importance. This agrees well with the evidence obtained at other native settlements (Lauwerier 1988).

Table 5. Animal bones from the Roman period.

species	number	%	weight (g)	%
cattle	542	68	7082.5	73
scheep/goat	25	3	98.0	1
pig	36	4	204.5	2
horse	184	23	2223.7	23
dog	13	2	40.4	0
deer	1	0	25.0	0
domestic fowl	1	0	0.9	0
total identified	802	*51*	9675.0	*66*
cattle/horse size	675	87	4642.6	95
sheep/pig size	65	8	92.3	2
mammal	40	5	175.0	4
total not identified	780	*49*	4909.9	*34*
total	1582		14584.9	

Little seems to have changed with respect to the preceding period. Both the quantitative data (*tables 3 and 5*) and the scarce information on the ages at which the animals were killed are almost exactly the same as in the Iron Age. They hence imply a mixed farming system with a heavy reliance on stock keeping in the Roman period, too. The cattle were raised for supplying the traction and dung required for crop cultivation, for procreation, and optionally also for supplying small amounts of milk. Two of the six bones that yielded indications of the butchering age, a metacarpal and the proximal part of a radius, were neither fully developed, showing that some of the cattle were killed prematurely. The animals in question were probably surplus bullocks, as far as crop cultivation was concerned, which, once they had reached a sufficient weight, could be killed for their meat. When the cattle that had been raised primarily for the benefit of crop cultivation grew old, they too were killed and consumed. And, like the horses and the sheep, the cattle will have produced hides that were processed into leather.

One of the holes that held the central posts of house H120 of the Westerveld settlement yielded the tibiotarsus of a chicken dating from the second half of the fist century. Although this is the only chicken bone found, we may assume that domestic poultry made their appearance in the yards of the farms of Oss in the Roman period. This agrees with the general assumption that chicken were introduced into our regions as domestic animals only after the arrival of the Romans (Prummel 1987: 187).

5.3 REMAINS RECOVERED FROM A SANCTUARY AND SOME OF THE DITCHES THAT ENCLOSED THE SETTLEMENTS

Some of the remains discussed above were found in fairly large features. The ditches of the rectangular sanctuary R57 measuring over 45 × 40 m contained 35 fragments of unburned bone. Besides indeterminable fragments they include a fragment of the *scapula* of a dog, teeth from upper and lower jaws, parts of the *sacrum*, the *ulna* and the *humerus* of a bovine animal, a *phalanx* and a fragment of a *radius* of a pig and parts of the *madibula*, tibia, ulna and vertebra of a sheep or goat. The remains do not differ in any respect from the other settlement refuse. So apart from the findspot itself, there is nothing to suggest that these bones derive from offered animals.

Three other large features that yielded bones are the two ditches that enclosed the Westerveld settlement and a ditch extending in a northwesterly direction that was connected to them. The range of faunal remains found in these ditches does not differ from that encountered elsewhere and represents the usual settlement refuse.

5.4 FOOD FOR THE DECEASED

Mixed with the cremated human remains that were found in some burials in the southeastern cemetery (see Van der Sanden this volume, *fig. 2*; Van der Sanden 1987e; Hessing in prep.) were some cremated bones of animals. These bones were analysed in a previous study (Lauwerier 1985). They will be described per burial (find number) below, with an indication of the joints associated with the bones, to give an impression of the quality of the meat in present-day terms (Born 1975).

Burial 1264 Pig: two fragments of a left *calcaneus*. The fact that the *epiphyses* had not yet fused implies that the animal was younger than 2-2.5 years; the size of the bone points to a very young animal: the leg of a piglet or sucking pig.

Burial 1278 Pig: one *caclaneus* of an animal of about the same age as the animal of burial 1264: the leg of a piglet or a sucking pig.

Burial 1281 Pig: distal *epiphysis* of a right *humerus* of an animal aged less than one year: part of the 'shoulder' from which hams are nowadays cut.
Mammal: indeterminable fragment.

Burial 1283 Pig: two incompletely developed left calcanei and one left *astragalus*: two legs; one fully developed and one incompletely developed distal part of left humeri and a proximal part of a left *radius* with a distal part showing no epiphyseal fusion: hams of an animal aged less than 1 year and an animal aged between 1 and 3.5.
Sheep or goat: the distal end of an incompletely developed metapodial of an animal aged less than 2 years: meatless.
Sheep- or pig-sized animal: indeterminable fragments.
Bird: indeterminable fragment.

These remains probably represent food intended to accompany the deceased. This custom is known from many other Roman-period cemeteries (Lauwerier 1983; Philpott 1991). In this case the food was burned along with the body on the pyre. When the cremated remains of the deceased were gathered, fragments of burned bone from the food were, deliberately or accidentally, picked up, too, and buried along with the human remains. They now give us some idea of the kinds of meat that accompanied the deceased. Only some of the original number of bones will have survived the burning, and only a small number of those bones will have been collected for burial. Add to this the various processes that have affected the bones over the centuries that have since then elapsed and it will be clear that the identified bones most likely present an incomplete and biased picture of the foodstuffs that accompanied the deceased. The almost meatless bone of a sheep, for example, will most probably have formed part of a larger leg of mutton. The recovered bones suggest that the deceased were accompanied

primarily by the meat of piglets. Sometimes mutton was burned along with the deceased and sometimes poultry, which, considering the bones identified elsewhere, will have been chicken (Lauwerier 1993). The high percentages of pig and chicken found in Roman cemeteries in northwest Europe contrast markedly with those encountered in settlements, and could imply that the meals of the deceased differed substantially from the usual diet (Lauwerier 1983). The bones found in burials may however give an entirely incorrect impression of the way things actually were, because most types of meat chosen for the meals of the deceased, for example most joints of beef, will have been boneless (Lauwerier 1993).

5.5. ROMAN INFLUENCES

One aspect that clearly reveals Roman influence on the native population is the increasing size of the animals, in particular the cattle. This is probably a consequence of the introduction of Roman agricultural know-how and the subsequent improvement of exploitation techniques, such as better fodder and care for the animals and the breeding of larger native cattle, possibly with the aid of imported larger animals. This process is fairly commonly attested all over northwest Europe and has also been observed in the surroundings of Nijmegen, where in the first two centuries AD the withers height of cattle increased from 110 cm or less to an average of 125 cm or more (Lauwerier 1988: 166-169). In the area of the artificially raised occupation mounds *(terpen)* to the north of the Roman frontier the cattle's withers height on the contrary remained unchanged (Todd 1975: 118-119; Knol 1983). The main advantage of larger animals, besides higher meat yields per animal, is the greater amount of traction they supplied for crop cultivation. The larger animals moreover yielded substantially larger hides. The army, with its demand for leather for the manufacture of, for example, tents and shields, will have been a particularly good market for these hides.

A considerable number of measurements are required to determine whether such Roman influences are observable at Oss, too. But owing to the fragmented condition of the bones only scanty evidence is available, from which for example withers heights cannot be inferred. The only two measurable distal parts of metacarpals of cattle from the Roman period have widths of 47 and 50 mm and thicknesses of 25 and 22 mm. These values fall within the range of widths of Iron Age cattle metacarpals of the site of Haren, situated less than ten kilometres away (Clason 1979). The Haren metacarpals have lengths of 158.5, 167.5 and 178.0 mm, which yield withers heights of 97, 103 and 109 cm. The cattle of Oss will hence have been as small as these animals. If we assume that the two measurable bones are more or less representative of the entire population, and are not by chance the bones of two extremely small animals from a group of much larger cattle, we can conclude that the developments that occurred for example in the surroundings of Nijmegen and Druten (Lauwerier 1988: 166-169) passed by the farmers of Oss. At Oss-Ussen the scale of farming – at least as far as cattle keeping is concerned – was probably not in any way influenced by the presence of the Romans, and remained at the same level as in the preceding period. Cattle will have been very important for the economy of the farmers of Ussen, partly also because of its role with respect to crop cultivation, and any improvement in the cattle would have had positive consequences for the employed farming techniques. The fact that no such improvement was realised suggests that the farming community of Ussen was only very indirectly involved in the Roman economy and was not familiar with the modern (by contemporary standards) farming techniques used elsewhere.

Table 6. Medieval (14th century) animal bones.

species	number	%	weight (g)	%
cattle	103	94	4347.0	98
pig	2	2	36.2	1
horse	4	4	69.4	2
total identified	109	*42*	4452.6	*73*
cattle/horse size	*153*	*100*	*1667.1*	*100*
total not identified	153	*58*	1667.1	*27*
total	262		6119.7	

6. Middle Ages (14th century)

Table 6, finally, presents a survey of the few hundred bones that were found in late medieval features. The majority were recovered from pits datable to the 14th century (see Schinkel, this volume *section 1.4*; Van der Sanden 1987b). Besides a few fragments of the teeth of an old horse, the bones are the usual butchery refuse and remains of meals deriving from cattle and pigs.

note

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