'Atiqot 98, 2020

Faunal Remains from Nazareth

Nimrod Marom

Introduction

The salvage excavations conducted at the Mary of Nazareth Center in Nazareth (see Alexandre, this volume) uncovered a faunal assemblage from Iron Age II (Stratum III), late Hellenistic–Early Roman (Stratum II) and Crusader–Mamluk (Stratum I) contexts. This report summarizes the zooarchaeological information that could be gleaned from the small-sized assemblage.

Methodology

The animal-bone remains were recovered by hand during the excavation by sifting through a 5 mm mesh in pits from Stratum II. The specimens were packed in paper bags inside a single standard carton box. The bones were cleaned from adhering sediments using tap water and dried in the shade before identification. The faunal remains were re-packed into their original packaging following the analysis. Statistics were carried out on PAST 3.01 software.

All specimens were identified to the nearest biological taxon possible (e.g., sheep, goat, camel) using the comparative collection of the Laboratory of Archaeozoology at the University of Haifa. Sheep, goat, donkey and horse specimens were distinguished based on morphological criteria (Johnstone 2004; Zeder and Lapham 2010). Some of the specimens could not be identified to a biological taxon, especially the long bone shaft fragments, rib fragments and vertebral fragments. Such unidentified specimens were assigned to a size-class taxon: medium-sized mammals (sheep- and goat-sized animals) or large-sized mammals (cattle-, horse-, and donkey-sized animals). Taxonomic abundances were estimated by the number of identified specimens (NISP) assigned to each biological taxon. Tooth wear scores (Grant 1982) and the state of epiphyseal fusion were recorded whenever possible. Measurements were taken following von den Driesch (1976). The small sample size did not allow for a meaningful estimation of the Minimum Number of Elements (MNE), or for a formal analysis of livestock animal demography.

All identified bone specimens were observed closely under a strong, oblique light for bone surface modifications. These include weathering (Behrensmeyer 1978), gnawing,

burning and butchery marks. Butchery mark location was recorded along with the type of instrument that most likely inflicted it. Functional interpretation of butchery marks was aided by the works of Rixson (1989) and Binford (1981). Fracture morphology was recorded following Villa and Mahieu (1991) to observe the relative frequency of breakage on fresh, as opposed to dry, bone.

RESULTS

Taxonomic Frequencies

A total of 129 identified animal bones was recorded, of which 88 bones could be assigned to a biological taxon (Table 1). Most of the identified bones (NISP = 56, 63%) are from Stratum I (Crusader–Mamluk periods); limited samples could be identified from Stratum II (late Hellenistic–Early Roman periods) (NISP = 27, 31%; 14 from Pit 168) and very small samples, from Stratum III (Iron II) (NISP = 5, 6%).

The dominant taxa in all three strata seem to be sheep (*Ovis aries*) and goats (*Capra hircus*). Since it is hard to distinguish between the remains of these caprines, they were relegated to a common sheep/goat taxon. The presence of both species in the assemblage is indicated, however, by the identification in Strata I and III of specimens identified as goats, and of a single specimen identified as belonging to sheep in Stratum II. Sheep and goats comprise 62% (NISP = 35) of the bones identified to taxon in Stratum I, 78% (NISP = 21) of the bones identified to taxon in Stratum II and 100% (NISP = 9) of the bones identified to taxon in Stratum III. Table 2 provides counts of taxa by stratum and locus.

Table 1. Taxonomic Frequencies in Number of Identified Specimens (NISP)[i]

Stratum / Taxon	Stratum I		Stratum II		Stratum III		*Total*
	NISP	%	NISP	%	NISP	%	
Sheep/Goat (*Capra hircus* and *Ovis aries*)	35	61	21	77	5	100	*61*
Cattle (*Bos taurus*)	8	14	4	15			*12*
Pig (*Sus scrofa*)	4	7					*4*
Equid (*Equus* sp.)	1	2					*1*
Donkey (*Equus asinus*)	2	4	1	4			*3*
Camel (*Camelus dromedarius*)	1	2					*1*
Dog (*Canis familiaris*)	2	4					*2*
Cat (*Felis sylvestris*)	1						*1*
Chicken (*Gallus domesticus*)	2	4	1	4			*3*
Total (identified to a biological taxon)	*56*	*100*	*27*	*100*	*5*	*100*	*88*
Medium Mammal		13		8		2	
Large Mammal		7		9		2	
Grand Total		*76*		*44*		*9*	

[i] Percentages were calculated out of the total NISP that could be identified in the stratum.

Table 2. Distribution of Identified and Unidentified Animal-Bone Remains by Taxon, Stratum and Locus[i]

Locus	Sh/G	Cattle	Pig	Camel	Equid	Dog	Cat	Chicken	LM	MM	Total
Stratum I											
104	6	3			1				2	1	13
144	2	2	1				1	1			7
145	3	2	1		2				1		9
146									1		1
147	24	1	2	1		1		1	3	12	46
Total	*35*	*8*	*4*	*1*	*3*	*1*	*1*	*2*	*7*	*13*	*76*
Stratum II											
109	4										4
112	2								1		3
131	1										1
164									2		2
166	1								1	1	3
167		1								2	3
Pit 168	10	2			1			1	5	3	22
171										1	1
Pit 173	3	1								1	5
Total	*21*	*4*			*1*			*1*	*9*	*8*	*44*
Stratum III											
170	1									1	2
172	4								2	1	7
Total	*5*								*2*	*2*	*9*

[i] Sh/G = Sheep/Goat; MM = medium-sized mammal; LM = large-sized mammal.

Cattle (*Bos taurus*), while far less frequently encountered, is the second most abundant taxon in the assemblage; its remains comprise 13% (NISP = 8) of the identified bones in Stratum I and 15% (NISP = 4) of the identified bones in Stratum II. The differences in representation between the strata are not meaningful, given the very small sample size.

Suid (*Sus scrofa*) remains occur in small numbers (NISP = 4, 7%), only in Stratum I. A butchery mark on the tibial shaft of a young pig, inflicted while filleting the meat off the bone, indicates that pork was consumed near the site.

Equid remains in the assemblage consist of a few bones (NISP = 3, 6%) from Stratum I and a single bone (4%) from Stratum II. The equid specimens that could be identified to taxon (NISP = 3) were all donkeys (*Equus asinus*). Camel (*Camelus dromedarius*) is represented by a single burned toe from Stratum I. The presence of dogs (*Canis familiaris*) and cats (*Felis sylvestris*) in Stratum I and the consumption of chickens (*Gallus domesticus*) in Strata I and II are evident by very few remains.

Skeletal Element Representation

Skeletal element representation could not be analyzed formally to detect patterns of fragmentation, density mediated attrition and selected transportation of elements according to their utility values; thus, only general remarks are offered regarding the presence and relative abundance of body-portion of the most common animals, sheep and goats, based on NISP counts (Tables 3, 4).

Skeletal elements from all parts of the body of sheep, goats and cattle are present in the assemblage. A rough comparison of the relative frequency of butchery waste (metapodials and phalanges) and consumption waste (upper limb and axis elements) in sheep, goats and medium-sized mammals does not reveal a significant difference between Stratum I and Stratum II (Chi-square = 1.19, P = 0.27). In both strata, consumption waste is more common (Fig. 1).

Table 3. Skeletal Elements by Stratum and Taxon

Taxon and Element	Stratum I	Stratum II	Stratum III	*Total*
Goat	*1*		*1*	*2*
Astragalus	1			*1*
Phalanx 1			1	*1*
Sheep		*1*		*1*
Radius		1		*1*
Sheep/Goat	*34*	*20*	*4*	*58*
Calcaneus	2		1	*3*
Femur	1	1		*2*
Humerus	4	2		*6*
Mandible		2		*2*
Maxilla	2	2		*4*
Metacarpus	2	1		*3*
Metapodial	1			*1*
Metatarsus	1	1		*2*
Pelvis	4	2		*6*
Phalanx	2	5		*7*
Radius	2	2	1	*5*
Rib	5	1	1	*7*
Scapula	1			*1*
Tibia	2			*2*
Vertebra	5	1	1	*7*
Cattle	*8*	*4*		*12*
Calcaneus	1	1		*2*
Maxilla	2			*2*
Metacarpus		1		*1*
Metatarsus	3			*3*
Pelvis		1		*1*

Table 3. (cont.)

Taxon and Element	Stratum I	Stratum II	Stratum III	*Total*
Phalanx	2			*2*
Radius		1		*1*
Pig	*4*			*4*
Maxilla	1			*1*
Tibia	2			*2*
Ulna	1			*1*
Equid	*1*			*1*
Humerus	1			*1*
Donkey	*2*	*1*		*3*
Mandible	2	1		*3*
Camel	*1*			*1*
Phalanx 1	1			*1*
Dog	*2*			*2*
Mandible	1			*1*
Metapodial	1			*1*
Cat	*1*			*1*
Pelvis	1			*1*
Chicken	*2*	*1*		*3*
Femur		1		*1*
Sternum	1			*1*
Tibiotarsus	1			*1*
Medium Mammal	*13*	*8*	*2*	*23*
Femur	5	3	1	*9*
Humerus	2	1		*3*
Radius			1	*1*
Rib	1			*1*
Tibia	5	4		*9*
Larger Mammal	*7*	*9*	*2*	*18*
Femur	2	2	1	*5*
Humerus		3		*3*
Mandible		1		*1*
Metatarsus		1		*1*
Rib	3			*3*
Scapula	1			*1*
Tibia	1	1	1	
Vertebra		1		*1*
Total	*76*	*44*	*9*	*129*

Table 4. Bone Measurements (mm) by Taxon

Taxon	Element	Stratum	Bp	Bd/BT	GL/GLl/GLpe
Cattle	Phalanx 2	I	30.5	25.9	
	Phalanx 3	I	29.4	25.1	
Chicken	Tibiotarsus	I	17.2	17.4	99.2
Goat	Astragalus	I		19.3	
	Phalanx 1	III	12.4	11.3	33.5
Sheep/Goat	Metacarpus	I	30.5		
	Phalanx 1	I	11.3	9.6	40.2
	Phalanx 1	II		26.0	
	Phalanx 2	II	14.5	12.2	
	Phalanx 1	II		26.0	
	Radius	II		24.4	
	Tibia	I		294.0	

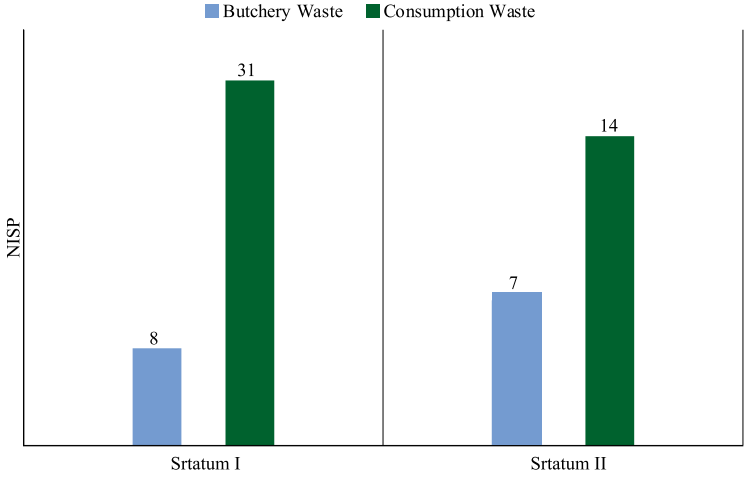

Fig. 1. The relative frequency in NISP of skeletal elements regarded as butchery waste (head and feet) and as consumption waste for Strata I and II.

Age-at-Death and Sex Ratios

The ages at death of the animals represented in the assemblage cannot be discussed meaningfully based on the small sample size presented in Table 5. The few observations suggest, however, that in both Stratum I and Stratum II, the caprines and the cattle include both younger and more mature individuals. This may support the interpretation of the finds

Table 5. Tooth Wear and Epiphyseal Fusion Data

Stratum	Taxon	Element	Epiphyseal Fusion/Tooth Wear
I	Camel	Phalanx 3	Fused
I	Cat	Acetabulum	Fused
I	Cattle	Calcaneus	Unfused
I	Cattle	Metatarsus	Fused
I	Cattle	Metatarsus	Unfused
I	Cattle	Phalanx 2	Fused
I	Cattle	Phalanx 2	Fused
I	Donkey	Mandible M3	Adult
I	Equid	Humerus, D.	Fused
I	Pig	Tibia, D.	Unfused
I	Sheep/goat	Metapodial	Neonate
I	Sheep/goat	Acetabulum	Fused
I	Sheep/goat	Acetabulum	Fused
I	Sheep/goat	Phalanx 1	Fused
I	Sheep/goat	Radius, D.	Fused
I	Sheep/goat	Scapula	Fused
I	Sheep/goat	Tibia, D.	Fused
I	Sheep/goat	Vertebra, lumbar	Unfused
II	Donkey	Mandible, M3	Adult
II	Sheep/goat	Phalanx 2	Fused
II	Sheep/goat	Radius, D.	Fused
II	Sheep/goat	Humerus, D.	Unfused
III	Cattle	Metacarpus, D.	Fused
III	Goat	Phalanx 1	Fused
III	Sheep/goat	Humerus, P.	Fused

as belonging to animals culled in the context of a rural producer economy that obtains meat from juveniles before marketing age and from old breeding stock.[1]

Of the three caprine pelvic fragments that could be determined as to sex, all from Stratum I, two belonged to female animals and one to a male. The equid remains are invariably of adult animals.

[1] For the urban consumer settlements, the age profile is confined to adult animals in general (Zeder 1991).

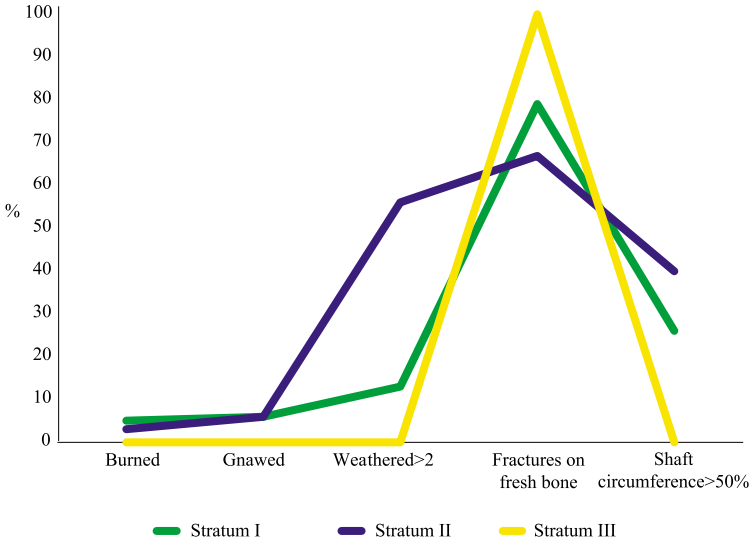

Fig. 2. Frequencies of bone surface modification according to strata.

Table 6. Frequency of Occurrence of Taphonomic Attribute and Total Sample Size by Stratum

Attribute	Stratum I		Stratum II		Stratum III	
	Sample N	Attribute N	Sample N	Attribute N	Sample N	Attribute N
Burned	80	4 (5%)	35	1 (3%)	14	0
Gnawed	80	5 (6%)	35	2 (6%)	14	0
Weathered >2	23	3 (4%)	16	9 (56%)	4	0
Fractures on fresh bones	24	19 (79%)	12	8 (75%)	2	2
Shaft circumference >50%	23	6 (26%)	10	4 (40%)	3	0

Bone Surface Modifications

The animal bones show very low frequencies of burning and carnivore gnawing (Fig. 2; Table 6). The frequency of fractures on fresh, as opposed to dry, bone is similar for Strata I and II. The degree of bone weathering, however, is markedly higher in Stratum II in comparison with Stratum I. This observation likely indicates a prolonged period of exposure to the elements of the bones from Stratum II before their final burial.

In all three strata, butchery was performed with metal knives and heavy, edged instruments (Table 7). Butchery marks were recorded on caprine, cattle and pig bones; most of the

Table 7. Locations of the Butchery Marks and Their Interpretation

Stratum	Taxon	Element	Location	Orientation	Instrument	Interpretation
I	Large Mammal	Rib	Cranial aspect of shaft	Transverse	Metal knife	Filleting
I	Pig	Tibia	Middle shaft	Diagonal		Filleting
I	Sheep/goat	Pelvis	Ventral aspect of ilium shaft	Transverse	Metal knife	Filleting
I	Sheep/goat	Radius	Distal articulation	Transverse	Cleaver	Dismemberment
I	Sheep/goat	Scapula	Tuber scapulae	Frontal	Cleaver	Dismemberment
I	Sheep/goat	Tibia	Distal shaft	Diagonal		Filleting
II	Large Mammal	Femur	Middle shaft	Transverse		Filleting
II	Large Mammal	Humerus	Distal shaft	Transverse		Filleting
II	Large Mammal	Tibia	Proximal shaft	Diagonal		Filleting
II	Large Mammal	Vertebra, thoracic	Neural spine	Diagonal		Filleting
II	Cattle	Metacarpus	Distal shaft	Transverse		Skinning
II	Sheep/goat	Humerus	Proximal and distal shaft	Transverse	Metal knife	Filleting
II	Sheep/goat	Vertebra, axis	Neural spine	Transverse	Cleaver	Dismemberment
II	Sheep/goat	Radius	Proximal shaft	Transverse	Metal knife	Filleting
III	Large Mammal	Tibia	Proximal shaft	Frontal	Cleaver	Dismemberment
III	Sheep/goat	Vertebra, atlas	Centrum	Sagittal	Cleaver	Dismemberment

butchery marks were inflicted when dismembering the carcass and filleting the meat from the bones. A single butchery mark on the distal part of a cattle metapodial from Stratum II likely occurred during skinning.

Conclusions

The animal bone assemblage is dominated by sheep and goats, with lower frequencies of cattle. Equids, very likely adult donkeys, were found in Strata I and II. Stratum I also contained lower frequencies of pigs, and the presence of camel, chicken, dog and cat remains. Age at death for beasts of burden is adult; the livestock animals from both Strata I and II show a mixed age and sex profile that is typical of a producer economy. Carnivore damage and burning are rare in the assemblage; thus, meat was apparently prepared by cooking or stewing, with consequent marrow extraction suggested by the many fractures that occurred on fresh bones.

Consumption waste is more common than butchery waste in the assemblage, indicating that butchery waste was discarded away from the context of consumption. It is possible

that the bones in Stratum II represent the redeposition of butchery waste into the fill. This is supported by the relatively high frequency of weathered bones in Stratum II. Such weathered bones indicate a prolonged stage of pre-burial exposure to the elements before their final deposition in the pit.

The faunal remains demonstrate tentative evidence for a simple village economy throughout its stratigraphic sequence. Should future excavations in ancient Nazareth produce larger samples of fauna, it will be possible to extend the scope of analyses and interpretations.

REFERENCES

Alexandre Y. This volume. The Settlement History of Nazareth in the Iron Age and Early Roman Period.

Behrensmeyer A.K. 1978. Taphonomic and Ecologic Information from Bone Weathering. *Paleobiology* 4:150–162.

Binford L.R. 1981. *Bones: Ancient Men and Modern Myths*. New York.

Driesch A. von den. 1976. *A Guide to a Measurement of Animal Bones from Archaeological Sites: As Developed by the Institut für Palaeoanatomie, Domestikationsforschung und Geschichte der Tiermedizin of the University of Munich* (Peabody Museum Bulletin 1). Cambridge, Mass.

Grant A. 1982. The Use of Tooth Wear as a Guide to the Age of Domestic Ungulates. In B. Wilson, C. Grigson and S. Payne eds. *Ageing and Sexing Animal Bones from Archaeological Sites* (BAR British S. 109). Oxford. Pp. 91–108.

Johnstone C.J. 2004. *A Biometric Study of Equids in the Roman World*. Ph.D. diss. University of York. York.

Rixson D. 1989. Butchery Evidence on Animal Bones. *Circaea* 6:49–62.

Villa P. and Mahieu E. 1991. Breakage Patterns of Human Long Bones. *Journal of Human Evolution* 21:27–48.

Zeder M.A. 1991. *Feeding Cities: Specialized Animal Economy in the Ancient Near-East.* Washington, D.C.

Zeder M.A. and Lapham H.A. 2010. Assessing the Reliability of Criteria Used to Identify Postcranial Bones in Sheep, *Ovis*, and Goats, *Capra*. *JAS* 37:2887–2905.