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The Faunal Remains from Kefar Gabirol, el-Qubeibe

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Introduction

The salvage excavation carried out in the winter of 2011 in Kefar Gvirol, el-Qubeibe, yielded an assemblage of faunal remains from Late Ottoman domestic contexts (see Jakoel, this volume). The faunal remains from the site were studied in terms of taxonomic composition, livestock demography and butchery practices, with reference to assemblage formation processes.

Methodology

Recovery and Cleaning. The animal bones were recovered by hand during the excavation, without sifting. The specimens were packed in paper bags inside three standard carton boxes. The bones were cleaned using tap water and a soft brush, and were dried in the shade before identification. Following analysis, the remains were repacked in their original paper bags and boxes.

Bone Identification and Counting Procedures. All specimens were identified to the closest biological taxon possible (e.g., sheep, goat, camel) using the comparative collection of the laboratory at the University of Haifa. Sheep (*Ovis aries*), goat (*Capra hircus*), donkey (*Equus assinus*) and horse (*Equus caballus*) specimens were distinguished by their morphological criteria (Johnstone 2004; Zeder and Lapham 2010). Many specimens could not be identified to biological taxon, especially long bone shaft fragments, rib fragments and vertebral fragments; these were assigned to a size-class taxon: medium-sized mammals (sheep- and goat-sized) or large-sized mammals (cattle-, horse- and donkey-sized). Taxonomic abundances were estimated by the number of identified specimens (NISP) assigned to each biological taxon.

Long bone fragments were assigned estimated completeness values that consisted of the percentages of the proximal articulation, proximal shaft, middle shaft, distal shaft or distal articulation of the complete element represented in the archaeological bone specimen. The minimum number of elements (MNE) was estimated using fraction summation (Klein and Cruz-Uribe 1984) and divided by the number of skeletal elements in a complete sheep's skeleton to derive a minimum number of animal units (MAU). Ribs, mandibles, astragals, calcanei, phalanges and vertebrae were described according to the diagnostic zones system of Dobney and Rielly (1988). The MNE for these elements was estimated to be equal to the most frequently encountered zone in the assemblage. The smaller carpal and tarsal bones, teeth and skull fragments were identified and recorded, but were not employed in the study of skeletal element frequencies. Skeletal element frequencies were correlated with meat (Binford 1978) and structural density (Lyman 1984) indices for sheep, to detect preferential utilization of skeletal elements rich in specific resources. Fragmentation intensity (NISP/MNE) was correlated with Binford's (1978) marrow index for sheep, to check for differential breakage intensity of bones according to their marrow-yields.

Age and Sex Determination. Age at death was estimated using mandibular tooth wear scores (Grant 1982) and the state of epiphyseal fusion for caprines (Zeder 2006) and cattle (Silver 1969). Pelvic morphology was employed as an indicator of sex in ungulates (Edwards, Marchinton and Smith 1982); Ruscillo's (2006) "Table Test" aided in sexing a canid (Canis familiaris) humerus. Sample sizes were too small to metrically estimate sex ratios.

Measurements. Specimens were measured whenever possible using Vernier callipers following von den Driesch (1976).

Bone Surface Modifications. All identified bone specimens were observed closely under strong, oblique light for signs of bone surface modifications, such as weathering (Behrensmeyer 1978), gnawing, burning and butchery marks. Butchery mark location was recorded along with the type of instrument likely to have been used. Functional interpretation of butchery marks was based on Rixson (1989) and Binford (1981). Fracture morphology frequencies were recorded by observing the relative frequency of breakage on fresh, as opposed to dry, bone, based on Villa and Mahieu (1991). Statistics were calculated using PAST 3.01 software (Hammer, Harper and Ryan 2001).

RESULTS

A total of 402 bones were identified in the assemblage, 247 of which were identified to biological taxon (Tables 1, 2). Sheep (*Ovis aries*; NISP = 9) and goats (*Capra hircus*; NISP = 8) dominate the assemblage (total caprine NISP = 97, 39%) together with cattle (*Bos taurus*; NISP = 94, 38%). Equid remains (NISP = 29, 12%) included single bones that were identified as donkey (*Equus asinus*) and horse (*Equus caballus*), indicating that both taxa were represented at the site. A few camel (*Camelus dromedaries*; NISP = 4, 2%) and chicken (*Gallus domesticus*; NISP = 7, 3%) bones were found. A single butchered gazelle (*Gazella* sp.) humerus fragment (L258, B1520) represents a rare hunting event. Some dog (*Canis familiaris*; NISP = 15, 6%) bones are evidence of the presence of these ubiquitous carnivores at the site; a single dog humerus was complete enough to determine that it belonged to a female canine. Additional remains include a complete skeleton and shell of a tortoise (*Testudo graeca*; L307, B1730) and a nearly complete skeleton of a dove or a pigeon (*Columbinae*; L423, B3626). Their complete and intact state seems to show that they are intrusive, from a time after the site was abandoned.

Table 1. Taxonomic Frequencies in Kefar Gabirol

Taxon	NISP[i]	% NISP
Sheep/Goat (Ovis aries/*Capra hircus*)	80	32
Sheep (*Ovis aries*)	9	4
Goat (*Capra hircus*)	8	3
Cattle (*Bos Taurus*)	94	38
Equid (*Equus sp.*)	29	12
Camel (*Camelus dromedaries*)	4	2
Chicken (*Gallus domesticus*)	7	3
Gazelle (*Gazella sp.*)	1	*
Dog (*Canis familiaris*	15	6
Total	*247*	*100*
Medium-sized mammal Large-sized mammal	51 104	
Grand Total	*402*	

[i] NISP = Number of Identified Specimens

* Slight presence

Table 2. Bone Measurements (in millimeters)

Taxon	Element	Notes	Bp	Bd/BT	GL/GLI/GLpe
Camel	Metatarsus Phalanx 1		63.2 51.8	39.4	111.3
Cattle	Astragalus			42.1	
	Calcaneus				129.7
	Metacarpus		47.3	46.9	182.6
	Metacarpus		46.0	47.0	173.1
	Metacarpus			56.8	
	Metacarpus		34.8		
	Metacarpus		50.7		
	Metacarpus			49.5	
	Metacarpus		40.2	47.1	204.3
	Metacarpus		47.1		
	Metacarpus			52.8	
	Metacarpus		42.9		
	Phalanx 1		29.4	27.5	56.5
	Phalanx 1		24.6	23.3	54.7

Table 2. (cont.)

Taxon	Element	Notes	Bp	Bd/BT	GL/GLI/GLpe
Cattle	Phalanx 1		26.2	25.0	53.2
	Phalanx 1		24.2	22.6	49.2
	Phalanx 1		23.9	24.0	52.7
	Phalanx 1		22.6	21.6	51.4
	Phalanx 1	Unfused	34.9		
	Phalanx 1		23.8	22.8	48.8
	Phalanx 2		23.7	21.1	
	Radius			60.5	
	Radius		77.0		
	Radius		77.6		
	Radius	Unfused		73.1	
	Scapula			89.0	
	Tibia			61.2	
	Tibia			59.3	
Equid	Humerus			49.3	
	Humerus			67.1	GLM = 250
	Radius		79.8		
	Radius			56.6	
	Radius		55.3	51.3	239.0
	Radius		60.5		
	Phalanx 1	Donkey	34.7	30.6	27.7
	Metacarpus	Horse	35.7	30.9	161.4
Sheep/Goat	Metacarpus		25.8		
	Metacarpus		23.5		
	Phalanx 2		15.0	11.5	26.6
	Tibia			31.8	
Sheep	Femur	Unfused			42.9
	Humerus			28.1	
	Humerus			32.9	
	Radius		32.6		
Goat	Astragalus			18.2	31.2
	Phalanx 1		13.6	12.7	37.2
	Phalanx 1		15.7	16.1	45.6
	Phalanx 1		13.7	13.2	40.4
	Phalanx 1		13.5	12.4	36.7
	Phalanx 1		13.6	13.3	43.2
Gazelle	Humerus			21.4	
Chicken	Tibiotarsus			11.4	
Dog	Metacarpus		10.6	9.2	52.6

Age at Death. Sheep and goat epiphyseal fusion data (Table 3) were drawn as a survivorship chart (Fig. 1). It can be concluded with caution due to the very small size of the sample that very few animals were older than two and a half years of age. Mortality seems to have been concentrated in the first year of life—likely the result of natural losses, and in the third year of life—when males are typically culled. The very few mature adult animals represented in the assemblage, aged over four years, are likely older breeding stock; the rest of the breeding stock may have been sold off-site. The small number of mandibles shows a similar distribution of age at death (Table 4).

Table 3. Epiphyseal Fusion Data for Sheep and Goats (after Zeder 2006), by Age

Element[i]	Fused	Unfused
Group A: 0–6 Months		
P. Radius		
Total		
Group B: 6–12 Months		
D. Humerus	2	1
Pelvis	1	
Scapula	1	
Total	*4*	*1*
Group C: 12–18 Months		
Phalanx 2	1	
Phalanx 1	5	
Total	*6*	*0*
Group D: 18–30 Months		
D. Tibia	4	1
D. Metacarpus		1
D. Metatarsus		
Total	*4*	*2*
Group E: 30–48 Months		
Calcaneum	1	2
P. Femur	1	1
D. Femur		
P. Ulna		
D. Radius		
P. Tibia		
Total	*2*	*3*
Group F: 48+ Months		
P. Hum		
Total		

[i] P = Proximal; D = Distal

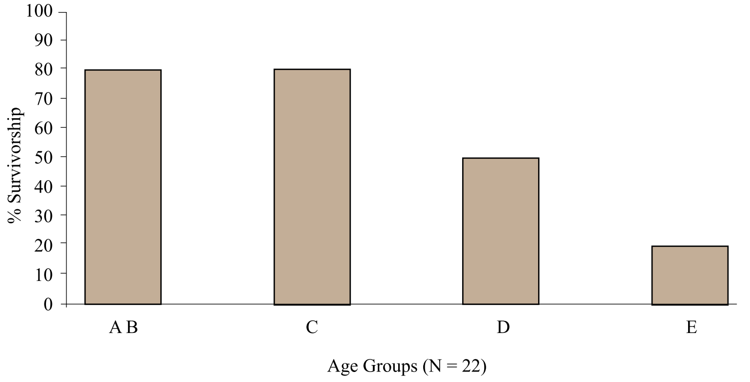

Fig. 1. Survivorship chart for sheep/goats (see Table 2).

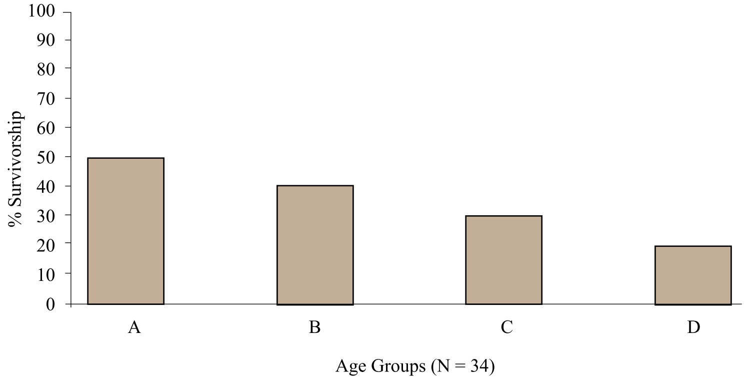

Fig. 2. Survivorship chart for cattle (see Table 4).

Based on epiphyseal fusion data, the survival rate of cattle (Table 5; Fig. 2) is very low for the first year of life and decreases steadily afterward. This sharp mortality peak early in life evidenced by the sample could, however, easily be due to the small sample-size; yet, it is supported to some degree by the small number of teeth (Table 4). The generally low rate of attrition in later age classes corresponds with a husbandry strategy targeting secondary products, very likely, for traction.

The four camel bones in the assemblage were all osteologically mature; they include worn mandibular and maxillary teeth and a fused metatarsus and phalanx. Equid remains could not be analysed in terms of age-at-death distribution, because the usefulness of the very small sample of bones of definable age (N = 12) is further compromised by the presence of two species: horse and donkey. Of the twelve equid bones recorded as fused or unfused, four were unfused, which suggests a generally mature population. One pelvic fragment of cattle, one of an equid, and another of a sheep or a goat seem to have belonged to female animals, based on their morphology. The small number of observations, however, deprives this datum of any analytical meaning.

Table 4. Tooth Wear Data for Livestock (Represented by Lowercase Letters), following Grant (1982)

Taxon	Teeth	Tooth-Wear Stage	Broad Age Class
Cattle	dp4	H	Young
	dp4	h	Young
	M1, M2, M3	h, g, g	Adult
	M1, M2, M3	M3 no signs of wear	Young
	M1/2	g	Adult
Sheep	dp4 (P4), M1, M2, M3	m(a), g, d, a	Young Adult
Goat	dp4, M1	h, b	Young
	dp4, M1, M2	l, e, a	Young Adult
Sheep or Goat	M1, M2	d, a	Young Adult
	P2, M2	a, g, c	Adult
	P3, M3	l, k, g	Mature Adult
Camel	M1/2	G	Adult

Table 5. Epiphyseal Fusion Data for Cattle

Element[i]	Fused	Unfused
Group A: 0–12 Months		
Scapula	1	1
Acetabulum	1	1
Total	*2*	*2*
Group B: 12–24 Months		
D. Humerus		
P. Radius	4	1
Phalanx 1	7	1
Phalanx 2	1	
Total	*12*	*2*
Group C: 24–36 Months		
D. Tibia	2	
D. Metacarpal	3	1
D. Metatarsal	3	1
Total	*8*	*2*
Group D: 36–48 Months		
Calcaneum	1	
P. Femur	1	
P. Humerus		1
D. Radius	1	1
D. Femur		
P. Tibia		
Ulna		1
Total	*3*	*3*

* P = proximal, D = distal

Table 6. Skeletal Element Frequencies for Goat-Sized and Cattle-Sized Animals[i]

Portion	Element	Sheep/Goat-Sized			Cattle-Sized		
		NISP	MNE	MAU	NISP	MNE	MAU
Head	Cranium	4	2	1	10	2	1
	Mandible	13	8	4	13	6	3
Axis	Vertebra, cervical	2	1	1	5	3	1
	Vertebra, thoracic	5	4	1	4	4	1
	Vertebra, lumbar	3	2	1	2	2	1
	Rib	42	28	2	43	20	1
	Pelvis	4	3	2	5	2	1
Upper limb	Scapula	5	4	2	10	4	4
	Humerus	6	4	2	7	2	1
	Radius	9	7	4	8	4	2
	Ulna	1	1	1	5	3	2
	Femur	12	4	2	6	1	1
	Tibia	21	8	4	15	3	2
Lower limb	Asragalus	2	2	1	1	1	1
	Calcaneus				1	1	1
	Metacarpus	8	7	4	7	4	2
	Metatarsus	2	2	1	14	6	3
Feet	Phalanx 1	5	5	1	8	8	1
	Phalanx 2	1	1	1	1	1	1
	Phalanx 3	1	1	1	1	1	1

[i] NISP = Number of Identified Specimens; MNE = Minimum Number of Elements; MAU = Minimum Number of Animal Units

Skeletal Element Frequencies. Skeletal element frequencies (Table 6) were calculated based on mammal size class taxa, to include skeletal elements that cannot be reliably identified to biological taxon. The sheep/goat category, which included the remains identified as sheep, goat or medium-sized mammal, shows a relatively balanced profile containing head, upper limb and lower limb elements. The axial skeleton (vertebrae, ribs and pelvis) and feet are relatively underrepresented (Fig. 3). No correlation was found between skeletal element representation and meat value (Spearman's r = 0.30, P = 0.21) or structural density (Spearman's r = 0.09, P = 0.72). Similarly, no correlation was detected between marrow content and fragmentation intensity (Spearman's r = -0.02, P = 0.97).

The group of cattle-sized mammals, consisting of cattle and bones identified as large-sized mammals, display a slightly different skeletal element frequency pattern (Fig. 4). Axial elements and feet are relatively underrepresented, as were with the medium-sized mammals. Upper hind limbs, however, are also relatively uncommon within the cattle-sized animal group. As with the sheep/goat-sized animals, the skeletal element representation is not correlated with meat value (Spearman's r = 0.14, P = 0.57) or structural density

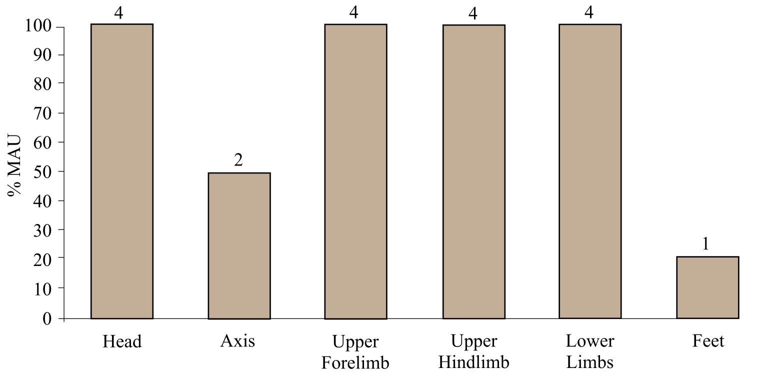

Fig. 3. Skeletal element frequencies for sheep, goats and sheep/goat-sized animals, presented as a percentage of the highest MAU for each skeletal portion (%MAU). Numbers above columns are MAU values.

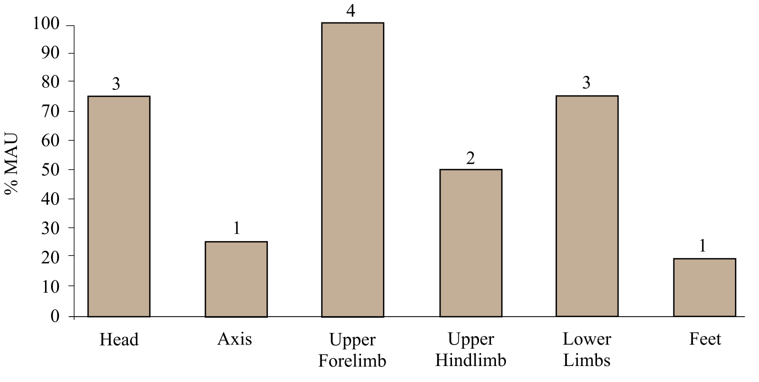

Fig. 4. Skeletal element frequencies for cattle and cattle-sized animals, presented as a percentage of the highest MAU for each skeletal portion (%MAU). Numbers above columns are MAU values.

(Spearman's r = 0.1, P = 0.72) and fragmentation intensity is not correlated with marrow content (Spearman's r = 0.39, P = 0.10) (Table 7).

Bone Surface Modifications. Of the 402 identified bones in the assemblage, few display marks of carnivore gnawing (N = 16; 4%), burning (N = 12; 3%) or weathering that compromised the intactness of the bones' cortical surfaces (weathering stages 2 or 3: N = 22; 22% of total N = 101 checked for weathering). Most (N = 51; 61%) of the observations (N = 78) on long bone fracture morphology indicate breakage of fresh bones. Taken together, bone surface

Table 7. Indices for Meat Content and Marrow Content (Binford 1978), and Bone Element Density (for scan site code abbreviations, see Lyman 1984)

Skeletal Element	Meat	Marrow	Scan Site and Density	
Cranium	12.86	1.00		
Mandible	14.12	10.35	DN4	0.57
Vertebra, cervical	55.32	1.00	CE1	0.12
Vertebra, thoracic	46.47	1.00	TH1	0.24
Vertebra, lumbar	38.88	1.00	LU2	0.22
Rib	100.00	1.00	R12	0.25
Pelvis	81.30	9.57	AC1	0.26
Scapula	44.89	6.23	SP1	0.25
Humerus	28.24	34.73	HU4	0.37
Radius	14.01	52.19	RA3	0.52
Femur	78.24	47.33	FE3	0.20
Tibia	20.76	78.92	TI4	0.36
Asragalus	6.37	1.00	AS1	0.54
Calcaneus	6.37	23.11	CA3	0.56
Metacarpus	4.74	67.39	MC4	0.54
Metatarsus	4.74	68.84	MR2	0.53
Phalanx 1	3.37	33.77	P12	0.40
Phalanx 2	3.37	25.11	P22	0.39
Phalanx 3	3.37	1.00	P31	0.30

modifications indicate peri-depositional breakage of bones, rapid burial of the assemblage and negligible amounts of carnivore-affected damage to specimens.

Butchery marks appear on cattle, caprine, camel and equid specimens (Table 8). Differences in the relative frequency of butchery marks that indicate specific functions appear in respect to taxon: cattle show a diversity of marks indicating the disarticulation of joints, dismemberment (chopping through bone to reduce the carcass to smaller pieces), defleshing and marrow extraction (Fig. 5). Since butchery marks on equid and camel bones are few, the major taxa that can be compared to cattle in respect to the functional variability of butchery marks are the caprines. The sheep and goats show a clear dominance of defleshing marks. The broad range of butchery functions observed on cattle and the narrower range observed on sheep and goats may be explained by greater familiarity with the butchery process of the latter, which translates into smoother disarticulation with fewer incidences of the butchery tool hitting bone.

Most of the butchery marks were made with a metal knife, and fewer, with a cleaver—a general term used here for a heavy, edged instrument (Fig. 6). The cleaver was apparently employed in fracturing long bone shafts for the marrow, evidenced by chop-marks on the shafts of marrow-rich elements. Three impact marks on caprine bones were made using a blunt instrument, perhaps a hammerstone used as an ad hoc tool for that purpose.

Table 8. Butchery Mark Location and Interpretation

Taxon	Element	Location	Tool	Function
Camel	Metatarsus	Proximal Shaft	Cleaver	Disarticulation
Cattle	Calcaneus	Tuber Calcis	Cleaver	Disarticulation
	Femur	Femur Head	Knife	Disarticulation
	Humerus	Distal Shaft	Knife	Defleshing
	Humerus	Distal Shaft	Knife	Defleshing
	Mandible	Diastema	Knife	Skinning
	Metacarpus	Distal Articulation	Knife	Skinning
	Metapod	Middle Shaft	Cleaver	Marrow extraction
	Metatarsus	Distal Shaft	Knife	Skinning
	Metatarsus	Middle Shaft	Cleaver	Marrow extraction
	Metatarsus	Distal Shaft	Knife	Skinning
	Pelvis	Middle Shaft	Cleaver	Marrow extraction
	Pelvis	Ischium, Ventral	Knife	Disarticulation
	Pelvis	Pubis, Ventral	Cleaver	Dismemberment
	Radius	Pubis, Ventral	Cleaver	Dismemberment
	Tibia	Distal Articulation	Knife	Dismemberment
	Ulna	Middle Shaft	Knife	Defleshing
		Above Olecranon	Knife	Disarticulation
Equid	Femur	Proximal Shaft	Cleaver	Marrow extraction
	Humerus	Distal Shaft	Knife	Defleshing
	Humerus	Middle Shaft	Knife	Defleshing
	Humerus	Proximal Shaft	Knife	Defleshing
	Radius	Distal Articulation	Knife	Disarticulation
	Radius	Middle Shaft	Knife	Defleshing
	Radius	Middle Shaft	Knife	Defleshing
	Vertebra, thoracic	Neural Spine	Knife	Defleshing
Gazelle	Humerus	Distal Shaft	Knife	Defleshing
Large Mammal	Cranium	Frontal bone	Knife	Skinning
	Mandible	Ascending Ramus	Knife	Disarticulation
	Metacarpus	Proximal Articulation	Knife	Disarticulation
	Pelvis	Ischium, Ventral	Knife	Disarticulation
	Radius	Proximal Shaft	Cleaver	Unknown
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Cleaver	Dismemberment
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Tibia	Middle Shaft	Cleaver	Marrow extraction
	Tibia	Middle Shaft	Knife	Defleshing
	Vertebra, Cervical	Zygapophysis	Cleaver	Disarticulation
	Vertebra, Thoracic	Neural Spine	Cleaver	Disarticulation
	Vertebra, Thoracic	Neural Spine	Knife	Defleshing

Table 8. (cont.)

Taxon	Element	Location	Tool	Function
Medium-Sized	Femur	Middle Shaft	Hammerstone?	Marrow extraction
Mammal	Femur	Middle Shaft	Cleaver	Marrow extraction
		Middle Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
Sheep or Goat	Femur	Middle Shaft	Knife	Defleshing
	Femur	Proximal Shaft	Hammerstone?	Marrow extraction
	Humerus	Distal Shaft	Knife	Disarticulation
	Humerus	Distal Shaft	Knife	Defleshing
	Mandible	Ascemding Ramus	Knife	Disarticulation
	Metacarpus	Distal Shaft	Cleaver	Marrow extraction
	Pelvis	Ilium, Ventral	Knife	Disarticulation
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Rib	Shaft	Knife	Defleshing
	Scapula	Neck	Knife	Defleshing
	Tibia	Distal Articulation	Cleaver	Disarticulation
	Tibia	Distal Shaft	Knife	Defleshing
	Tibia	Proximal Shaft	Knife	Defleshing
	Vertebra, thoracic	Centrum	Cleaver	Dismemberment
	Vertebra, cervical	Centrum	Cleaver	Dismemberment
	Femur	Distal Articulation	Knife	Disarticulation
		Middle Shaft	Hammerstone?	Marrow extraction
	Humerus	Distal Articulation	Knife	Disarticulation
	Mandible	Ascending Ramus	Knife	Disarticulation
	Radius	Proximal Shaft	Cleaver	Unknown

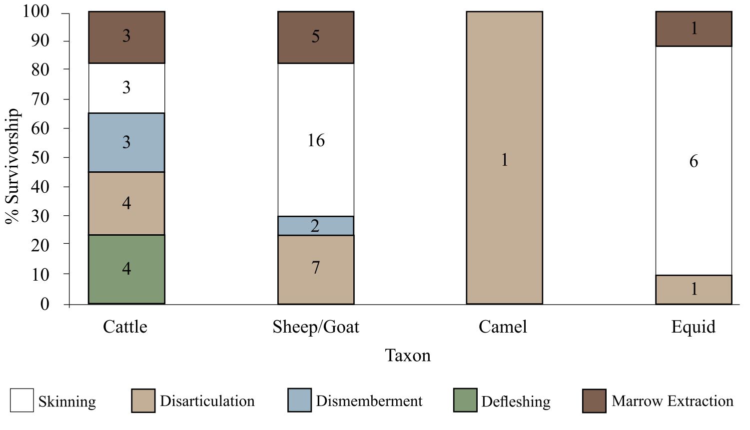

Fig. 5. Butchery mark function as inferred for cattle, caprine, camel and equid specimens. Numbers on columns mark absolute number of marks (see Table 8).

Fig. 6. Frequency of butchery marks inflicted by different types of tools (Blumenschine, Marean and Capaldo 1996; Seetah 2006) displayed for mammal size-class taxa (see Table 8).

SUMMARY AND CONCLUSIONS

The small faunal assemblage from Late Ottoman Kefar Gabirol is well-preserved, the result of quick burial and little interference by gnawing carnivores. Thus, bones from the site provide a rare glimpse into livestock economy and consumption practices at a rural site of the period. It should be remembered, however, that the small sample size of identified bones for each of the major taxa is such that conclusions can only be tentative, especially in respect to livestock demography.

Most of the consumed animals discarded in the excavated domestic contexts were sheep, goats and cattle, with very few chickens, and meager evidence for hunting. Cattle frequencies are rather high, and chicken frequencies low, which may be due to recovery methods that bias the sample toward larger bone specimens. Livestock demography for sheep and goats indicates consumption of both very young and adult animals, which suggests culling from locally-owned flocks, or, in other words, a rural economy with direct interaction between herder and consumer (Zeder 1991). Cattle consumption seems to have been limited to animals that died very young, and to more mature animals. This pattern can be interpreted as the result of harvesting from a stock reared for work, in which most meat is obtained from juvenile mortality and post-productive mature adults.

Horses, donkeys and camels are represented in small quantities. All, including the camel, were probably work animals (compare, for example, Thomson 1859:293). Consumption marks are evident on the camel, as well as on some equid bones. Whereas there exists a tradition of camel consumption in the region, explaining the butchery of equids is slightly more difficult. The eating of donkey flesh is forbidden to Muslims, but horse meat is allowed, although discouraged (*makroukh*) by most Sunni Muslims (Waines 2003:79). The butchered remains could conceivably have belonged to a single horse, which was consumed in one of the many lean years that punctuated the generally excellent agricultural productivity of the region (see Reilly 1981; for a recent example of horse meat as fall-back food, see Rudoren 2012).

The butchery process seems to have been carried out in two distinct locations; the low frequency of foot elements in both medium- and large-sized mammals may indicate that slaughter, evisceration and skinning took place away from where the carcasses were consumed. Animal carcasses were disarticulated using metal knives and cleavers with an apparent lack of skill in the butchery of larger cattle. All parts of the body were found on-context, with no selection of meatier portions. The low frequency of burned bones is evidence that the meat was prepared by cooking or stewing, rather than roasting. Larger bones show chopping marks on their shafts, probably indicating the use of a cleaver to breach the marrow cavity after removal of the flesh. Some of the sheep and goat bones bear impact fractures that seem to have been inflicted by a blunt instrument, probably a hammerstone or similar ad hoc tool.

The faunal remains from Kefar Gabirol provide evidence of an autarkic village livestock economy in Late Ottoman times and reveal some indications of the butchery and consumption practices of the villagers. Published zooarchaeological work on contemporary assemblages is virtually lacking and it is to be hoped that additional excavations will facilitate further research on this fascinating range.

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