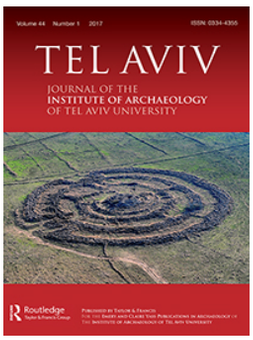

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The Faunal Evidence from Early Roman Jerusalem: The People behind the Garbage

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This is a study of the animal remains from the Early Roman period landfill in the "City of David" ridge, the largest assemblage of fauna published from Jerusalem. The research includes both a zooarchaeological and taphonomical study and has a twofold objective: first, to understand landfill site formation processes and the activities related to it; and second, to examine the social and religious identity of the inhabitants of the different sectors of Jerusalem's 'Lower City'. The results are assessed in light of previously investigated contemporaneous faunal assemblages that originated in other parts of the city, as well as from the northern part of the same landfill, which is closer to the Temple Mount. The study demonstrates that garbage was dispatched to the city dump in an organized manner. It identifies the producers of the waste as Jewish. It also establishes that the portion of landfill excavated and published here includes garbage from daily secular activities rather than from cultic endeavours, to differ from previously excavated assemblages from the same landfill, which is composed of refuse originating from ritual pursuits.

Keywords Zooarchaeology, Jerusalem, Kidron Valley, Settlement refuse, Roman period, Temple Mount, Jewish dietary laws

In this article we present the results of a study of faunal remains from Jerusalem's landfill, located on the western slope of the Kidron Valley (Gadot 2014 and see further below; Fig. 1 for location). We aim to shed light on the dietary habits, identity and economic status of the residents of the different sectors that comprised Jerusalem's 'Lower City' during the Early Roman period, a time when the city had reached its zenith as an urban and cultic centre. Animal economy in general develops and changes over time, in response to social and environmental conditions. Faunal remains from archaeological contexts are studied to understand subsistence strategies of ancient settlements. They can also help to shed light on the socio-economic identity of the people inhabiting a site (deFrance 2009; Russell

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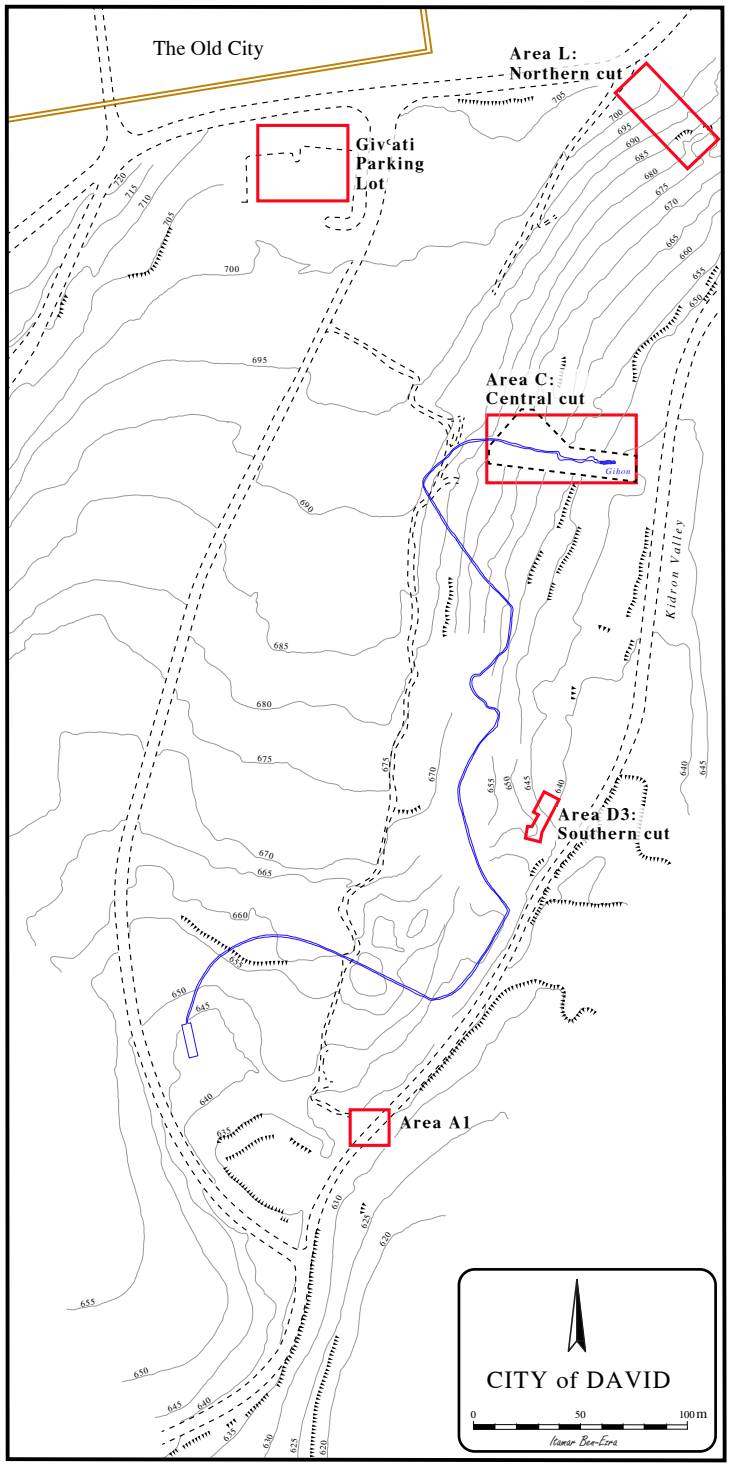

FIGURE 1 Map of relevant excavations with comparable faunal assemblages in the City of David in relation to the location of the Southern cut (Area D3).

2011). In general, since garbage disposal practices mirror subsistence activities and habits of occupation (Rathje and Murphy 2001), specifically daily life, they are useful tools for archaeologists who seek to reconstruct the material life of a site.

Early Roman Jerusalem

The Early Roman period in Jerusalem (63 BCE–70 CE) was a time of political and social turbulence—an unrest that eventually led to its destruction (Safrai 1974; Levine 2002). According to Flavius Josephus' description (*War* 5.137–151) the city was composed of three main sectors:

1. The 'Upper City', west of the Temple Mount, the location of the upper agora or market place (*War* 5.137) and the royal palaces;
2. The 'Lower City', mainly the narrow ridge south of the Temple Mount known today as the 'City of David'. This was also the location of the Acra.
3. Bezetha, located north of the 'Upper City'. As Jerusalem's population increased this area became inhabited (*War* 5.148–151).

A populated ravine known as the Tyropoeon Valley separated the Upper and Lower Cities (*War* 5.140).

Social status in Jerusalem, like other hierarchical societies, was probably based on lines of inheritance, occupation, achieved wealth, gender, age and other components (Weber 1968: 302–311; deFrance 2009: 313). Unlike the usual Roman urban-rural nexus, which had landowners constituting the majority of the ruling class, Jerusalem's dominant elite consisted primarily of Temple priests (Safrai 1974: 184; Goodman 1993: 52; Levine 2002: 351). The lower strata of Jerusalem's social hierarchy were commoners: merchants, labourers and farmers (Goodman 1993: 52–53). Slaves were the lowest social class in the Roman world, including Jerusalem (*ibid.*: 52–53). Roman soldiers were also a part of Jerusalem's population, and there was an auxiliary unit stationed outside the walls and in the Antonia Fortress (Stern 1974: 580–582; Levine 2002: 286; Acts 21:34–37; *War* 5.5). Distinguishing between these groups archaeologically is a difficult task, since important markers of material culture (e.g., clothes and textiles) have mostly vanished. Especially interesting is the social status of the inhabitants of the 'Lower City'. While most scholars perceived the area as housing a poorer population, recent archaeological work conducted along the paved street in the Tyropoeon Valley and residential quarters to its east and west (Shiloh 1984: 4–5; De Groot *et al.* 1992: 1–30; Greenhut 2011; Szanton and Uziel 2015; Roth, Szanton and Langgut 2016), as well as in the Giv'ati Parking Lot (Ben-Ami 2013: 22–31), show that the neighbourhood housed rich families.

Dietary patterns and usage of animals, as reflected through the garbage, can shed light on the social hierarchy in the city.

Excavation of the 'Lower City' and of Jerusalem's landfill

In the 1st century CE, Jerusalem expanded both in size and in population (Levine 2002; Geva 2014; Zilberstein 2015). It is possible that this influx of people to the city created a need for a centralized garbage dump. The western slope of the Kidron Valley was a reasonable location for this dump (landfill) because it was outside the city walls and thus in a less inhabited area (Reich and Shukron 2003; Bar-Oz *et al*. 2007; Amit 2009: 17).

Our faunal assemblage originated from Area D3, an archaeological section cut into the landfill 200 m south of the Gihon Spring (hereafter called the Southern cut) (Fig. 1). It was retrieved from two sub-sections: the northern, which is 12 m long (west to east) and nine m wide (north to south); and the southern, which is seven m long (west to east) and four m wide (north to south) (Gadot 2014: 273). The purpose of exposing the two sub-sections was to understand how the landfill layers accumulated, and whether there were differences in the composition of the garbage.

The landfill is made up of alternating layers. Upon first impression, some layers seemed rich in finds and other layers were of similar composition but contained a greater amount of soil (Fig. 2). The finds-rich layers contained ceramic sherds, coins, seeds, charcoal, stone vessels and other stone objects and glass.

Twenty buckets per layer were wet sieved (using a 0.5 mm mesh), and the remainder of buckets were dry sieved (using a 1 cm mesh). In areas that could not be attributed to a specific layer, but which were still clearly part of the landfill, we worked by hand; in addition we sieved one of every 30 buckets per locus (Gadot 2014: 276).

The resulting sample size of faunal material from the Southern cut is the largest to be presented from Jerusalem to date.

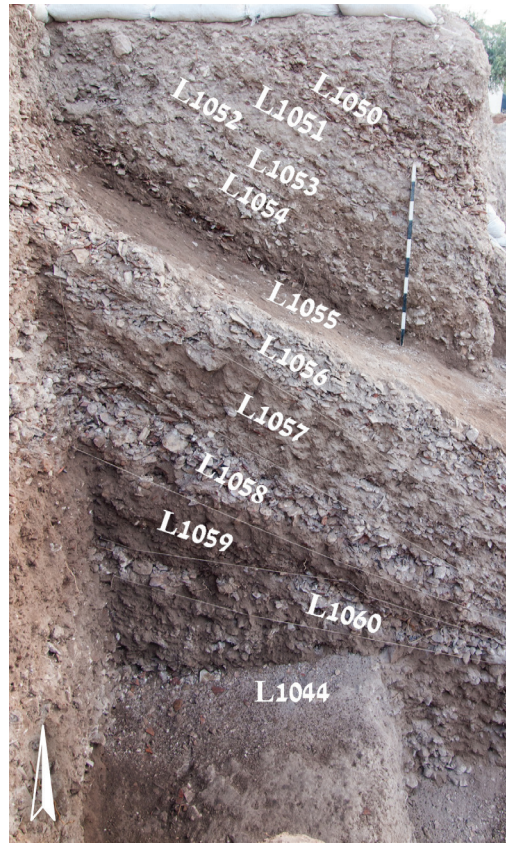

Figure 2 The alternating layers making up the landfill as seen in the Southern cut (Area D3).

Methodology

Identification of skeletal elements and species was accomplished through the utilization of comparative collections stored at the Laboratory of Zooarchaeology of the Institute of Archaeology and the Steinhardt Museum of Natural History of Tel Aviv University. Protocol for recording element portions followed Sapir-Hen, Gadot and Finkelstein (2016) and included identification of all skeletal elements. Statistical analysis was processed using PAST 3.01 (Hammer, Harper and Ryan 2001).

The Number of Identified Specimens (NISP) was used as a basic measure of taxonomic abundance (Lyman 2008). The relative abundance of skeletal elements was quantified using Minimum Number of Elements (MNE). MNEs were calculated based on the most abundant element portion to avoid overlap of specimens (Dobney and Reilly 1988). Minimum Animal Units (MAU) was calculated in order to compare the frequency of skeletal elements within the assemblage; this was done on the basis of MNE, and calculation followed Lyman's procedure (1994: 104).

In order to understand which side limbs were more abundant, the number of the right and left side of the hind limb elements (femur, tibia and metatarsal) were statistically tested. Sided NISP was used to assist in our inquiry into the social classes of the assemblage. Prevalence of the right hind limb, which was the priestly portion (Lev 7:28–37), would, for example, have been a socio-economic marker of a person of privilege in Jerusalem.

Taphonomic characteristics, from anthropogenic and natural agents, were also assessed in order to understand site formation processes, as well as indications of cultural markers. These include the presence of gnawing by scavengers (O'Connor 2000: 48), damage by weathering (Behrensmeyer 1978), as well as a degree of charring (Stiner *et al*. 1995). The elements' completeness (MNE/NISP) was also assessed in order to understand the degree of fragmentation of the assemblage.

Exploitation patterns of livestock were examined by estimating age at death for caprines and cattle. Estimation of age at death that resulted from epiphyseal fusion of caprines was based on Zeder's (2006) stages. For cattle, epiphyseal fusion was based on Silver (1969: 284–301). Tooth remains were too scarce and broken to allow estimation of age. Exploitation patterns of livestock were also examined by estimation of sex ratios in caprine herds. This was achieved through measuring the large sample of first phalanxes, and based on Zeder's recorded regional variation of male and female sizes (2001: 66, Fig. 5). Metrical data was collected following von den Driesch's (1976) guidelines. Finally, spur presence/absence of *gallifromes* (e.g., turkey, chicken, goose, quail, partridge and pheasant) was recorded in order to provide estimation of their sex (following Serjeantson 2013: 35, 47).

Results

The faunal remains

A total of 5,701 (NISP; Table 1) bone fragments were identified from the Area D3 assemblage. Domestic livestock are the most dominant species, representing 92%. Of livestock animals, the most dominant are caprines (sheep and goat, *Ovis aries* and *Capra*

TABLE 1
Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI) for Southern cut assemblage

	Species	Common Name	NISP	MNI	% NISP
Domesticated Ungulates					
	Capra hircus	Goat	245	10	4
	Ovis aries	Sheep	315	13	6
	Caprine size	Medium mammal	3910	33	69
	Bos taurus	Cattle	728	13	13
	Equus asinus	Donkey	7	2	
Wild Mammals					
	Gazella gazella	Mountain Gazelle	18	2	
	Dama mesopotamica	Fallow deer	4	1	
	Cervus elaphus	Red deer	14	2	
	Lepus capensis	Cape hare	1	1	
	Small Carnivores		48	1	1
	Canis familiaris	Domestic dog	7	1	
Aves					
	Gallus gallus	Chicken	393	16	7
	Anser anser	Goose	1	1	
	Anas platyrhynchos	Duck	3	1	
	Alectoris chuckar	Partridge	7	2	

hircus) with 3,910 (NISP) identified elements (69% of the entire grouping). The ratio between identifiable sheep and goats is 3:2. Cattle (*Bos tarsus*) represents the next most prevalent species with 728 (NISP) identified elements (13%). Wild species represent less than 1% . The remaining 7% of the assemblage belongs to avian species, namely chicken (*Gallus gallus,* N: 393*).*

Formation processes

The initial hypothesis of this study, that the soil-rich layers had fewer finds in them, turned out to be wrong. Comparing the density of faunal remains (NISP per excavated volume) between the two alternating types of layers shows that faunal remains are found in equal proportions (t= 1.24, p =0.22; Table 2). Thus, we assume they both represent the same event of deposition. An explanation for the formation of the soil-rich layers is beyond the scope of this paper. The assemblage was not altered significantly by natural agents: 87% of the bones were recorded at Stages 0–2 of Behrensmeyer's scale (1978: 157), in addition to very minimal evidence for animal gnawing on the bones (N: 8). The minimal evidence for modification by natural agents suggests that the refuse was either quickly covered or protected from scavengers.

Approximately 14% of the assemblage shows evidence of burning and charring (this tallying includes fragments unidentified to element or taxon). The fragmentation of elements (calculated as MNE/NISP) is very high (Fig. 3).

TABLE 2
Alternating layer loci with NISP/thickness of remains

Loci	Material	Thickness (cm)	NISP	Volume (NISP/Thickness)
1046	Rich in finds	100 cm	286	2.86
1050	Rich in finds	15 cm	95	6.33
1051	Rich in soil	25 cm	53	2.12
1052	Rich in finds	10 cm	152	15.2
1053	Rich in soil	20 cm	77	3.85
1054	Rich in finds	30 cm	137	4.56
1055	Rich in soil	10-30 cm	96	3.2–9.6
1056	Rich in finds	20-50 cm	184	3.68–9.2
1057	Rich in soil	40 cm	146	3.65
1058	Rich in finds	50 cm.	242	4.84
1059	Rich in soil	75 cm	80	1.06
1060	Rich in finds	20 cm	69	3.45
1061	Rich in soil	40 cm	185	4.625
1062	Rich in finds	40 cm	121	3.02
1063	Rich in soil	40 cm	50	1.25
1068	Rich in finds	10 cm	41	4.1
1070	Rich in finds	25 cm	21	0.84
1071	Rich in soil	20 cm	42	2.1
1072	Rich in finds	20 cm	13	0.65

Caprine and cattle exploitation

Based on stages of epiphyseal fusion, the majority (75%) of caprines were slaughtered before they reached one and a half years of age (Fig. 4a). A sharp drop in survivorship is already noted at six months of age, which can be attributed to killing newborns. The overall survivorship curve of caprines depicts a meat-focused strategy based on culling sheep and goats at one and a half years, when they reach full meat weight (Payne 1973: 281; Vigne and Helmer 2007: 25). The skeletal elements frequency (calculated as MAU) for caprines, shows that the meat-bearing elements were the most prevalent (i.e., scapula, humerus, radius, and tibia) (Table 3). In order to estimate caprines sex ratio, 1st phalanx measurements were compared to those provided by Zeder (2001: 66, Fig. 5). The comparison suggests that there are slightly more female sheep than male sheep with a ratio of 2:1.5; for goats, the results show an opposite pattern with more males, in a ratio of 1:1.8 (Fig. 5).

The cattle survivorship curve shows that many were culled at a young age, with 65% survivorship to two years, and a constant decrease in survivorship, with only 20% kept beyond three years (Fig. 4b). This profile portrays a culling strategy aimed at meat consumption (Grant 1982: 91–108; Vigne and Helmer 2007: 25). Cattle meat-bearing elements are the most prevalent, particularly the forelimbs humerus and the radius, as

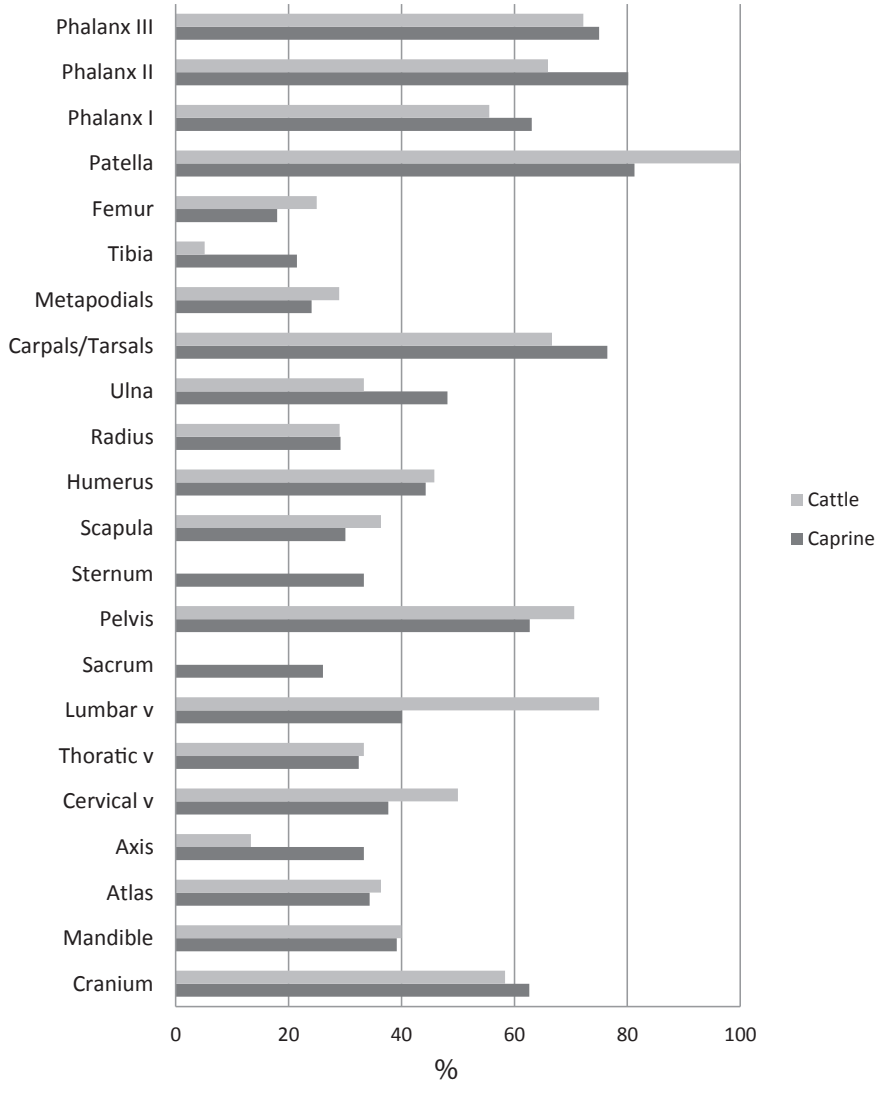

Figure 3 Completeness, based on Minimum Number of Elements divided by Number of Identified Specimens (MNE/NISP) for caprines (sheep and goat) and cattle.

well as the hind limb femur. However, there is also a high frequency of meat-poor parts (i.e., phalanges, metapodials and cranium) (Table 3).

There is no significant difference between the NISP of right and left side hind limbs of both caprines and cattle (caprine: p= 0.356, χ^2= 2.062, df= 2; cattle: p= 0.291, χ^2= 2.464 df= 2). Both halves of the animals were consumed with no bias, theoretically eliminating the possibility of the remains being consumed by the elite priestly class that were tithed the right hind limb (i.e., tibia, femur, and metatarsal) (Lev 7:28–37).

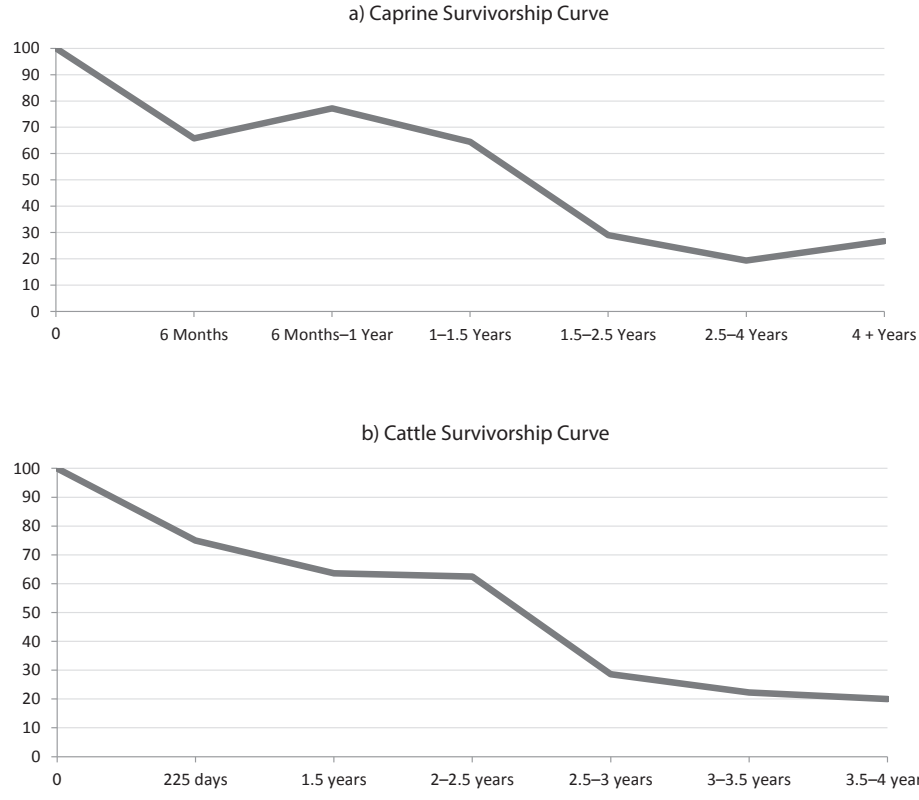

FIGURE 4 Southern Landfill's kill-off pattern based on epiphyseal fusion of long bones: (a) caprine; (b) cattle.

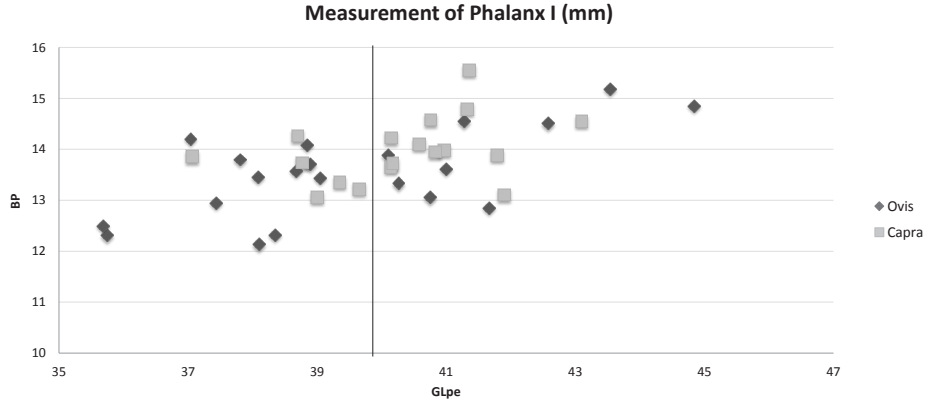

FIGURE 5 Measurements of the Southern Landfill's caprine 1st phalanx with line separating between female (left) and male (right) caprines.

TABLE 3
Number of Identified Specimens (NISP), Minimum Number of Elements (MNE), Minimum Animal Units (MAU), and Percentage of Minimum Animal Units (MAU%) for Caprines and Cattle in the Southern cut

	Caprine				Cattle			
Element	**NISP**	**MNE**	**MAU**	**MAU%**	**NISP**	**MNE**	**MAU**	**MAU%**
Cranium	83	52	1.57	3.70	12	7	0.21	2.73
Mandible	143	56	4.66	10.98	10	4	0.33	4.30
Atlas	32	11	11	25.88	11	4	4	51.60
Axis	21	7	7	16.47	15	2	2	25.80
Cervical v	162	61	12.2	28.70	12	6	1.2	15.48
Thoratic v	188	61	4.69	11.04	15	5	0.38	4.96
Lumbar v	157	63	9	21.17	4	3	0.42	5.52
Sacrum	23	6	6	14.11	2	0	0	0
Pelvis	169	106	17.66	41.56	17	12	2	25.80
Sternum	3	1	1	2.35	0	0	0	0
Scapula	153	46	23	54.11	11	4	2	25.80
Humerus	192	85	42.5	100	24	11	5.5	70.96
Radius	243	71	35.5	83.52	31	9	4.5	58.06
Ulna	54	26	13	30.58	6	2	1	12.90
Carpals/Tarsals	238	182	8.27	19.46	42	28	1.27	16.42
Metapodials	357	86	21.5	50.58	107	31	7.75	100
Tibia	228	49	24.5	57.64	39	2	1	12.90
Femur	189	34	17	40	24	6	3	38.70
Patella	16	13	0.92	2.18	1	1	0.07	0.92
Phalanx I	214	135	16.87	39.70	36	20	2.5	32.25
Phalanx II	131	105	13.12	30.88	47	31	3.87	50
Phalanx III	52	39	4.87	11.47	18	13	1.62	20.96

Avian Exploitation

Four species of birds were identified in the assemblage: chicken (*Gallus gallus*; NISP: 390), partridge (*Alectoris chuckar*; NISP: 7), goose (*Anser anser*; NISP: 3), and duck (*Anas platyhynchos*; NISP: 1) (Table 1). Notably, pigeons (*Columba livia*) are absent from the assemblage. Chicken was the most dominant species, representing 97% of the avian assemblage. Based on spur absence on the metatarsus, the majority (~77.5%) of chickens were females. The skeletal elements frequency (MAU%) of chicken shows a dominance of meat-bearing elements; meat-poor elements are nearly absent or in low frequencies (Fig. 6). The absence of the latter elements, i.e., carpometacarpi, cranium, wing and feet, indicates that the chickens were decollated elsewhere and represent consumed remains. The absence of these bones could not be attributed to their small size, as the assemblage was intensively sieved, promoting the retrieval of all types of elements (see also Serjeantson 2013: 164).

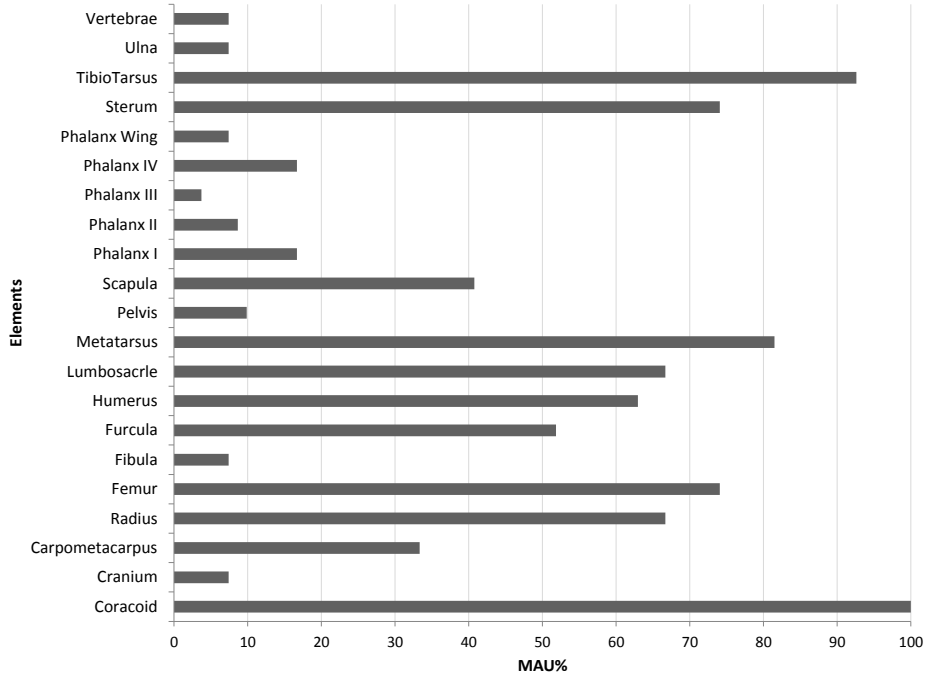

Figure 6 Percentage of Minimum Animal Units (MAU) for element frequency of chicken.

Discussion

Our analysis of the faunal remains from the Southern cut reveals a distinct pattern of exploitation of livestock, primarily for their meat, and transportation of the garbage in an organized manner to the city dump.

There are five comparable published assemblages available. Our main comparison is to the finds from earlier excavations into Jerusalem's landfill (Reich and Shukron 2003; Bar-Oz *et al*. 2007; Bouchnik 2011). The first in Area C (Central cut) and the second in Area L (Northern cut), located southeast of the Temple Mount (Fig. 1). The excavation of the Central and Northern cuts was carried out with similar collection methods, and included wet sieving, making it an excellent assemblage for comparison.

Three other publications present material from residential areas within ancient Jerusalem: 1) Further south on the Southeastern Hill (the 'City of David' ridge) in Area A1, which is comprised of dwellings of possibly lower economic status groups (Horwitz 1996; Horwitz and Tchernov 1996); 2) The Givʿati Parking Lot elite quarters located along the Tyropoeon Valley (Bar-Oz and Raban-Gerstel 2013) near the Dung Gate of the Old City; 3) Refuse debris from a fill beneath a floor in the excavation of the stepped street near the Temple Mount (Stratum IV of Reich's Temple Mount excavation; Reich *et al.* 2015: 21–22, not on plan).

The formation of the assemblage

The fragmentary nature of the Southern cut assemblage suggests that the remains form a secondary deposition (Fig. 3). As the refuse accumulated, post-depositional processes caused

the bones to break and fracture further. Ostensibly the pressure and movement down the slope caused most of the fragmentation (Fig. 3). The weathering pattern of the bones and the lack of gnaw marks by scavengers suggest that the bones did not remain exposed for extensive periods of time. The high percentage of burnt remains suggests that deliberate cremation or incineration of refuse (Nicholson 1993: 412) was employed. The Northern cut assemblage also suggests a considerable percentage of burned remains, with 6–7% of livestock remains showing evidence of charring (Bouchnick 2011: 121). In contrast to these assemblages, the charred remains in the residential area excavated in Area A1 and the Givʿati Parking Lot reflect household consumption patterns, with less than 2% of the total assemblages suggesting burned material (Horwitz 1996: 305; Bar-Oz and Raban-Gerstel 2013: 352). The logic behind burning refuse is to consolidate the landfill. Moreover, incineration obscures the smell of decomposition, reducing the attraction of scavengers (Rathje and Murphy 2001: 33). Intensive burning practices in the landfill have hitherto only been positively identified in the faunal remains.

As mentioned previously, the landfill is made up of alternating layers. Some layers seemed rich in finds and other layers were of similar composition but contained a greater amount of soil. The faunal remains from the alternating layers were not limited to, nor found in higher frequencies in the find-rich layers. While modern disposal practices include covering refuse with a layer of earth between deposits (Rathje and Murphy 1989: 101), it seems that the habits in Roman Jerusalem included throwing bones away with other organic or earthen material (Hayden and Cannon 1983: 130). The difference in the amount of soil between the two types of layers is probably related to downslope erosion. Layers were also observed in the documented sections of the Northern cut (Bar Oz *et al*. 2007: 4), suggesting that this phenomenon was not coincidental.

Animal economy and population identity

The species present in the landfill is comprised of domestic livestock including some chicken, supplemented by lower frequencies of wild game. The remains from all five assemblages representing Early Roman Jerusalem include only animals that are ritually pure (kosher; e.g., sheep, goats, cattle and deer) as stated in Deuteronomy 14:3–21 and Leviticus 11:1–47 (Horwitz 1996: 312–314; Bar-Oz *et al*. 2007: 7; Bouchnick 2011: 239–242; Bar-Oz and Raban-Gerstel 2013: 352). The lack of pig remains and other non-kosher animals (i.e., camels, badgers and hares) reinforces the literary evidence: Philo of Alexandria mentions Roman displeasure with the Jewish prohibition of pork (*Embassy* 360–367). Josephus references the dietary regulations and the priestly portion transcribed in Leviticus and Deuteronomy (*Ant.* 3.259 and *Ant.* 4.71–74).

Our comparison with the northern and Central cuts focuses on frequencies and identity of domesticated species, skeletal element frequencies and aging and sexing profiles. Bouchnick, Bar-Oz and Reich (2004; Bar-Oz *et al*. 2007; Bouchnick 2011) propose that the faunal remains in the Northern cut were derived from cultic activities in the Temple and hence deemed the landfill ‘holy garbage’. Hartman *et al*. (2013) showed, based on carbon and nitrogen isotope analysis, that the majority of caprines originated from areas outside Jerusalem. They concluded that Jerusalem’s economy relied mainly on pilgrimage, promoted by the city’s cultic nature.

The disparities between the Northern and Central cut assemblages and the Southern cut assemblage are striking (Table 4). The most notable difference is the presence of pigeons in the Northern cut assemblage (23% of the avian bones, Table 4; Bouchnick 2011: 73). This stands in stark contrast to the absence of pigeons in the southern landfill. Pigeons are also absent in the lower economy dwellings in Area A1 (Horwitz and Tchernov 1996: 299) and in other residential assemblages. The presence of pigeons in Jerusalem is widely attested in the archaeological remains of columbaria and in literary sources (Zissu 1995; *War* 4.181). While pigeons are commonly used for consumption and their faecal matter is used as fertilizer (Hirschfeld and Tepper 2006), in Jerusalem they were predominantly used by the lower classes as sacrificial offerings in the Temple (Safrai 1994: 176; Lev 14:30; Mark 11:15; Matt 21:12; John 2:16). The observed difference in pigeon exploitation is likely a reflection of the Northern cut's proximity to the Temple Mount (for pigeon exploitation as sacrificial offerings see Lev 14:30; Mark 11:15; Matt 21:12; John 2:16). It appears that pigeons were not a part of the daily domestic consumption of food within Jerusalem.

Domestic chicken is the third most exploited animal, and the most exploited avian species in the Southern cut assemblage. Chicken body part frequencies suggest that the remains are primarily from consumption debris, as indicated by lack of cranial and phalanx elements (Serjeantson 2013: 164; Horwitz and Tchernov 1996: 299). There was a clear preference for hens, suggesting that these remains come from slaughtered poultry rather than from other activities, such as cockfighting.

There are also differences between the two parts of the landfill in domestic livestock exploitation. The relative frequencies of these species are similar (see Bouchnick 2011: 61), with caprines dominating the assemblages (NISP % ~70–80%) and cattle representing the next most exploited animal (NISP % ~10–13%). The majority of caprine body parts present in the Southern cut were the forelimbs, which are high meat-bearing parts, whereas the Northern cut has a higher frequency of meat-poor elements (cranial, metapodials and

TABLE 4

Exploitation modes of caprines, cattle and birds in Jerusalem's landfill

Animals	**Southern cut, Area D3 (This Study)**	**Northern and Central cuts, Area's C and L (Bouchnick 2011)**
Caprines		
Age	Exploitation of meat	Exploitation of meat
Sex	Equal male and female	Primarily males
Body Parts	High meat-bearing elements	Low meat-bearing elements
Cattle		
Age	Exploitation of meat, but some kept for breeding and traction	Exploitation of meat, none kept past 4 years of age
Body Parts	Meat-bearing elements and industrial waste stock, specifically metapodials	Low-meat bearing elements, specifically cranial and mandibular elements
Birds		
Chicken	Consumption remains	Consumption remains
Pigeon	Absence	Presence

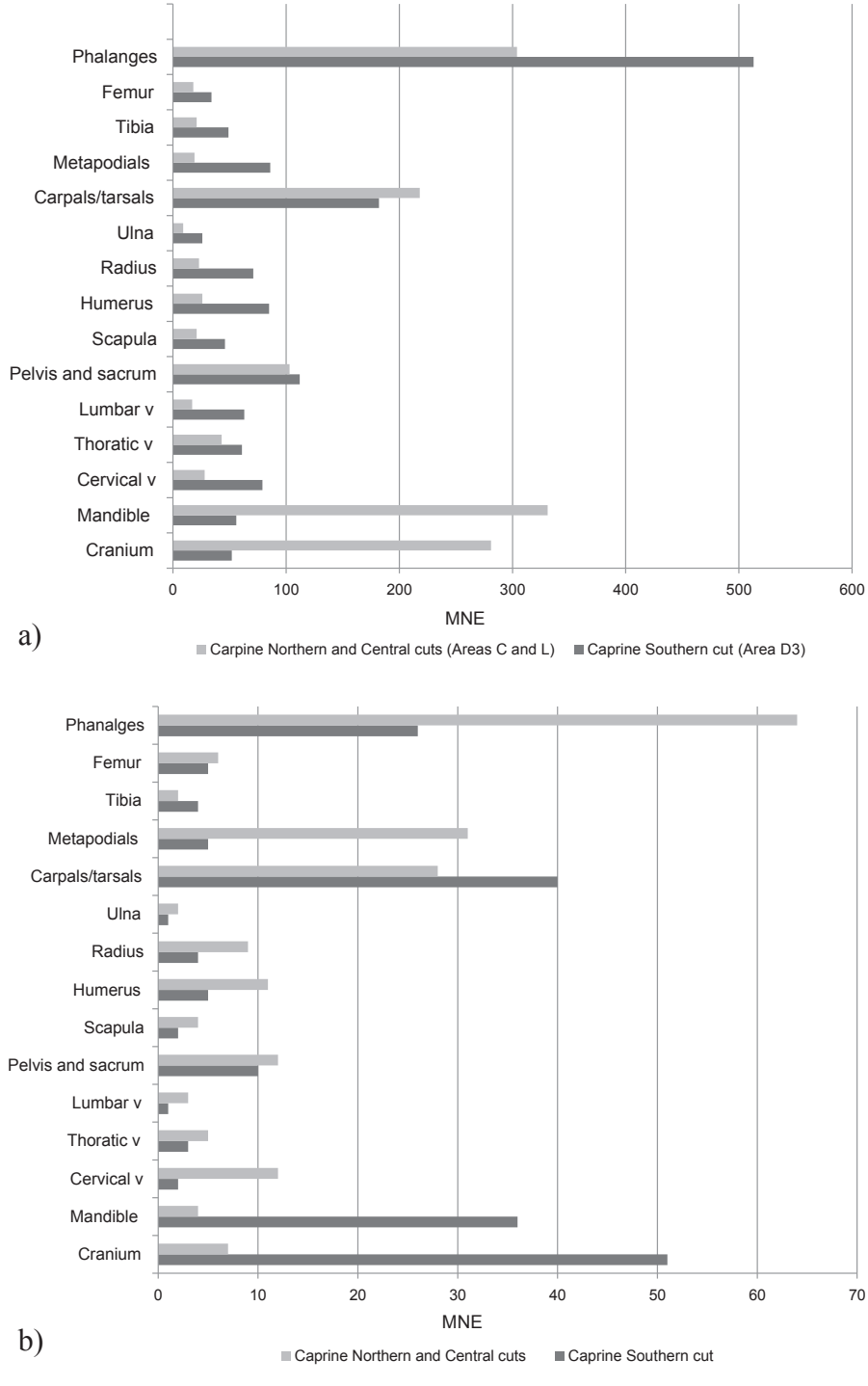

FIGURE 7 Body part frequencies of (a) caprines and (b) cattle based on Minimum Number of Elements of the Northern landfill (based on Table 4.12a published in Bouchnick 2011: 95) and the Southern landfill.

phalange; Bouchnick 2011: 95; Fig. 7a). The body part frequencies of cattle in the Southern cut are primarily trunk elements, in addition to meat-poor elements. This pattern differs from the Northern cut, which displays higher frequencies of the meat-poor elements (Bouchnick 2011: 95) (Fig. 7b). The disparity between the two assemblages might be an indication that the northern assemblage demonstrates more primary butchering and food preparation, as well as potentially more sacrificial and/or feasting remains (Bouchnick 2011: 142; Bar-Oz *et al*. 2007: 10; Lev-Tov and McGeough 2007: 105; Exod 29:17). In contrast, the livestock body part frequencies from the Southern cut represent more consumption remains. The Southern cut refuse was most likely removed from urban residential areas. This observation is supported by the minimal preference for the priestly portion (right hind limb; Lev 7:28–37); but note that this aspect was tested only in the Southern cut.

Caprines and cattle from both assemblages were exploited mainly for their meat (Fig. 8a and 8b). The majority of caprines in the Southern cut were slaughtered at one and a half years, when they reached optimum meat-gain age versus cost of rearing (Payne 1973: 281). The remaining caprines were most likely kept alive for breeding and secondary products. Similarly, the main usage of cattle was for their meat, as the majority of the individuals were killed before the age of three (Fig. 8b). Some cattle were kept alive past this age, suggesting a husbandry strategy that included some level

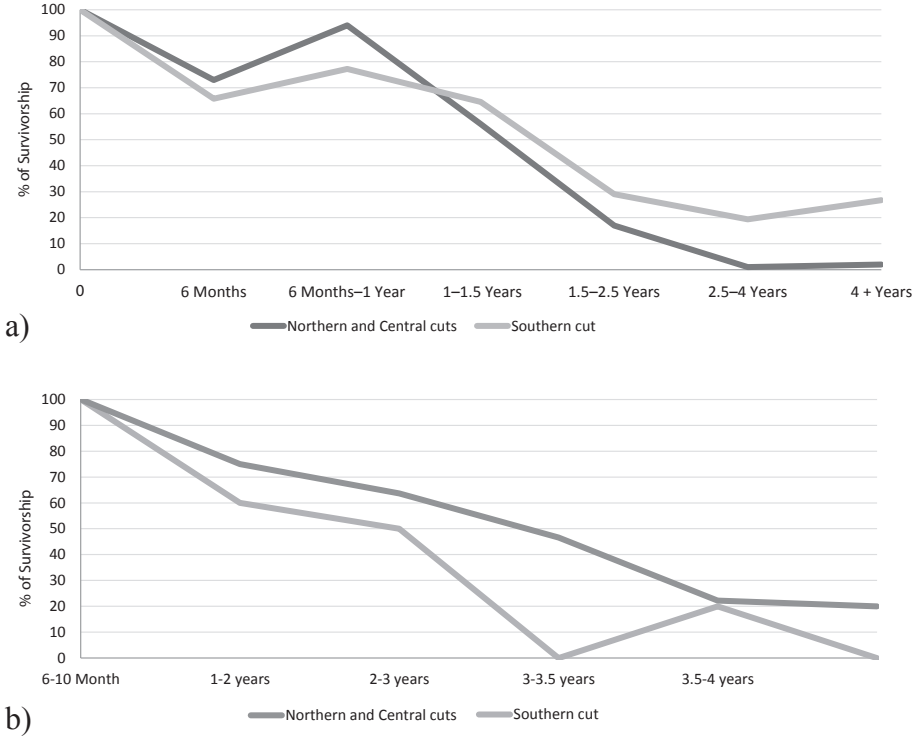

Figure 8 (a) Caprine and (b) cattle survivorship of the Northern cut (based on Table 4.29 and Table 4.30 published in Bouchnick 2011:168-171) and of the Southern cut.

of breeding and agricultural work (Sasson 2008: 44–45). The observed pattern differs from the Northern cut, where the focus was *solely* on meat, and none of the animals survived to older age (Fig. 8b).

The pattern of caprine exploitation in both assemblages shows a similar preference for juveniles, with a focus on six months to one year of age (Fig. 8a). This pattern can be related to economic strategies in several ways. The first is that meat-producing strategy eliminated animals at the end of the suckling period, around three months of age, or at one year. The guiding principle was to eliminate any animal that might be an economic burden (Borowski 1998: 231). Economically encumbered animals would be those that did not produce anything other than their meat, namely males, because they could neither produce milk nor reproduce. As the elite favoured young animals, the producers could command a high price for this meat (Payne 1973: 281). A counter argument would be commoners' exploitation of juvenile caprines; communities that depend on milk and meat production sometimes kill off surplus lambs when there is not enough winter feed to provide for them (Payne 1973: 282). However, considering the proximity of the Temple, the ritualistic killing of first-born young caprines (Exod 29:28; Lev 9:3, 12:6, 23:12; Num 12:14, 28:3) cannot be overlooked as a possible explanation for the culling pattern. Possibly, some of the meat from sacrificial offerings (that was not claimed by the priestly portion of the right hind limb; Lev 7:28–37) was sold in the market to those who wanted a piece of religious fare (Safrai 1994). Differentiating between animals slaughtered because they were unproductive and those that were sacrificed is difficult, due to the use of unnecessary herd animals as ritual sacrifices. The selection of male yearlings for sacrifice (Lev 1:10, 3:6, 5:6, 9:3, 16:3) is a natural reaction to everyday subsistence strategies, which demand killing-off male yearlings to preserve resources (e.g., pasture and grazing land) for females kept for secondary products (Sasson 2008: 126).

Males and females were evenly represented in the Southern cut assemblage. As the assemblage is not male dominated, this reflects a non-sacrificial or non-cultic pattern (Maher 2014: 117; Fig. 5). The Northern cut's caprine assemblage is dominated by males, reflecting a more cultic usage of the animals closer to the Temple (Bouchnick 2011: 172).

Other features also shed light on the social and economic classes within Jerusalem's urban society. Differences in the economic standing of various population sectors are already evident in the animal economy of the Iron Age (8–6th centuries BCE; Sapir-Hen, Gadot and Finkelstein 2016). In the Early Roman period, assemblages from residential areas differ from the landfill areas (Table 5). A higher frequency of cattle is present in the residential assemblages as opposed to those found in landfill assemblages. Yet, this result may be biased due to different collection methods (hand collecting vs. sieving). These assemblages also differ in the mortality profiles and body part frequencies of caprines and cattle. In Area A1 of the City of David, Horwitz (1996) noted that 50% of the caprines were slaughtered by the age of three. Additionally, caprine body parts were found with a proportionally high incidence of butchery marks (*ibid*.: 312). This pattern may be indicative of exploitation by lower socio-economic groups, that is concentrated on the local preparation and consumption of meat. Such practice is in accordance with the status of the City of David ridge during the Early Roman period.

TABLE 5
Number of Identified Specimens (NISP), percentage of Number of Identified Specimens (NISP%), and Minimum Number of Individuals (MNI) of caprines and cattle for the Early Roman areas of Jerusalem

Area	Reference	Caprine			Cattle		
		NISP	%NISP	MNI	NISP	%NISP	MNI
City of David: Area A1 Str. VI	Horwitz 1996: 312	563	65	18	230	27	5
Givʿati: Area M, Str. VII	Bar-Oz and Raban-Gerstel 2013: 350	375	69.40	20	129	23.90	5
City of David: Areas C and L	Bar-Oz *et al*. 2007: 5-8; Bouchnick 2011: 68-78	3787	78	-	717	15	-
Temple Mount Road	Reich *et al*. 2015: 21	1806	61	-	999	33	-
City of David: Area D3	This study	4470	79	56	728	13	13

The subsistence strategy of the 'Lower City' in the Givʿati Parking Lot reflects an elite exploitation pattern. Elite demand placed a high value on secondary products such as milk and wool, as well as breeding, based on relatively low proportions of juvenile caprines (less than 30%; Bar-Oz and Raban-Gerstel 2013: 351–352). Continued support for preference for secondary products is sourced from the mortality profile of the elite quarter's cattle. Aging of cattle reflects some slaughtering of prime adults, with young cattle comprising only 15% of the total cattle herd (*ibid*.: 352). While a high proportion of mature cattle is not typically a symbol of wealth, Bar-Oz and Raban-Gerstel (*ibid*.) suggest a husbandry system that placed a high value on secondary products and their use as traction animals. The elite social class may also be reflected in the fill remains from the paved street near the Temple Mount; Reich *et al.* (2015: 26) suggest that it is the high frequency of cattle that represents the apogee of cultic activities in Jerusalem in the Early Roman period.

To summarize the points raised above, the Southern cut's assemblage has more in common with the residential areas than with the northern part of the same landfill, suggesting different sources within the city for refuse deposits.

Conclusions

Our assessment of the faunal material from the Southern cut contributes to a greater understanding of its formation processes and the economic, social and religious status of the people behind the garbage. Our results demonstrate that during the Roman period the Jerusalem inhabitants observed Jewish dietary practices. The culling strategies and body part frequencies of caprines and cattle, as well as the absence of pigeon remains, suggest that the remains from the Southern cut represent disposal from the residential areas of Jerusalem's 'Lower City'. This is in contrast to the previously studied Northern cut in the landfill, which represents the disposal from cultic activities. Finally, our results demonstrate that differences in animal usage, stemming from socio-economic disparities, existed in Jerusalem of the Early Roman period.

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