

Report of Archaeofauna from Undir Sandmúla and Undir Bálabrekku, Bárðdælahreppur, N Iceland

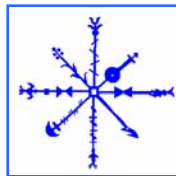
Tom McGovern, Ramona Harrison, Seth Brewington & Peter Kuchar

nabo@voicenet.com

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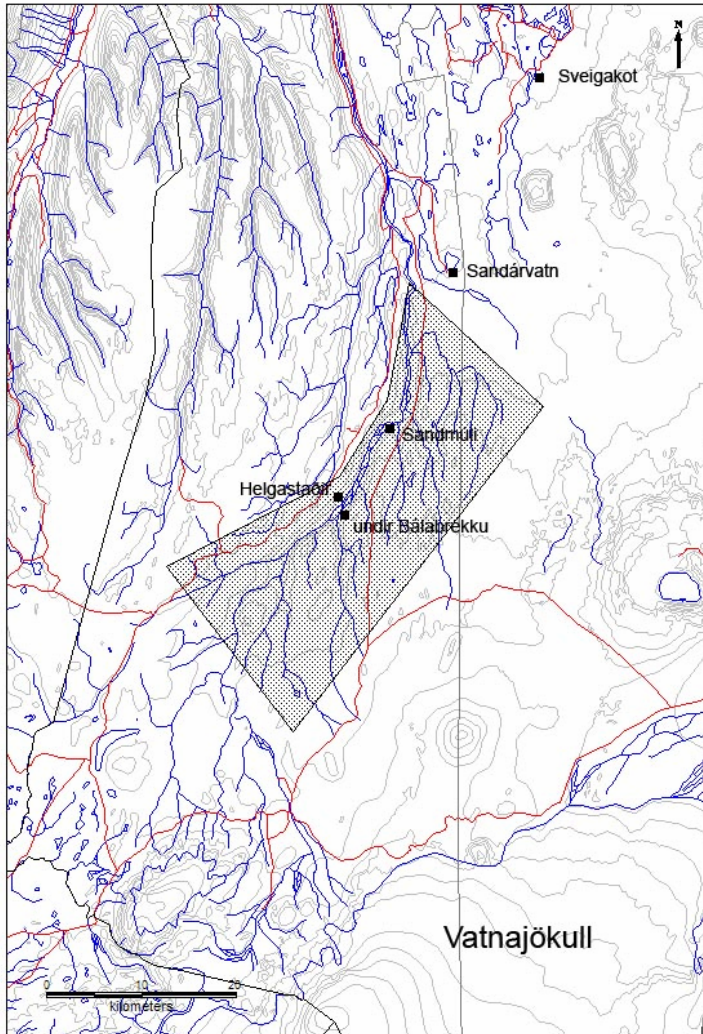
CUNY NORSEC LABORATORY REPORT # 29

CUNY Doctoral Program in Anthropology
Brooklyn College Zooarchaeology Laboratory
Hunter College Bioarchaeology Laboratory

Summary: Small archaeofauna from two highland sites located above 400 m above sea level, over 100 km inland in the upper reaches of the Skjálfandafjót river valley indicate the early presence of human settlement in this far inland area. While heavily deflated, the site of Undir Sandmúla produced an archaeofauna from stratified context directly above the Landnam sequence tephra, probably dating to the late 9th or early 10th century. This collection is from a highly burnt "fireplace cleaning" deposit which limits the survival of fish and bird bones, but a quantifiable number of mammal bone fragments could be identified. The domestic mammal assemblage strongly indicates the presence of a full farm with some variant of the mix of species associated with the Settlement Age in Iceland (cattle, horse, pig, sheep).

Background:

This interim working paper presents the zooarchaeological analysis of animal bone collections from two heavily eroded sites in Bárðdælahreppur in Northern Iceland. The long valley of the glacial Skjálfandafjót river extends from the Arctic Ocean in the north well over 100 km into the central inland highlands, and Bárðdælahreppur is today one



of the furthest inland settled districts in northern Iceland. The region is today nearly completely deforested and uplands are heavily eroded, but good grazing remains in valley bottoms and in sheltered areas. The valley has been under investigation by Dr. Orri Vésteinsson (U. Iceland) and *Fornleifastofnun Íslands* (Archaeological Institute Iceland) for several years, and in 2004 several inland sites were located with surface scatters of animal bones and tephra sequences suggesting surprisingly early occupation of this inland region. A small surface collection of bone from the site Undir Bálabrekku was collected in 2004 and is reported here along with the 2005 surface collection. However, the main focus of this report is the larger, partially stratified archaeofauna excavated in 2005 from the ruins of the site of Undir Sandmúla (ca 15 km further N,

see Map Figure 1)

On August 3-4 2005 a midden team (Tom McGovern, Seth Brewington, Konrad Smiarowski, Raymond Petit) collaborated with the FSÍ in the investigation of Undir Sandmúla (SDM). Undir Sandmúla is located at approximately 412 meters above sea level, and 100 km from the coast. The site had produced prior surface collections of Viking age artifacts, and has been visited by several scholars over the past century. The site was very heavily eroded, with most of the surface reduced to a prehistoric till and boulder surface. Scatters of bone in several areas resting directly upon this terminal erosion surface indicated the presence of very extensive (and probably very rich)

midden deposits once existing around the surviving structures. Four soil pH readings on exposed cultural layers produced consistent readings of 6.5-6.75. These readings are closely comparable to the soil pH (very slightly acid to neutral) prevalent in Mývatnssveit and certainly have contributed to the exceptional bone preservation evident on site, despite harsh conditions of deflation and exposure. Most of these surface scatters (Areas 3 and 4) produced only the densest bone skeletal elements, and even these were heavily weathered, showing exfoliation of the compact surface and strong bleaching. These indications of long surface exposure combined with the small but flourishing moss colonies established on many fragments indicated that the archaeological matrix that once held these bones had been eroded away quite some time ago, and no *in situ* bone bearing deposits could be located near the structural remains.

Partially turf covered mounds to the NW (4) and NE (5) of the main hall structure (1) also showed associated bone scatters. It was hoped that these stabilized dunes might cover *in situ* midden deposits as at Hrísheimar and Sveigakot in Mývatnssveit. A systematic coring transect (16 Oakfield tube cores all carried to H3 prehistoric tephra) of the larger Area 5 unfortunately revealed only sterile, wind deposited banded natural deposits 50-90 cm thick which extended down to either the Landnám (LNS) sequence of ca AD 872+/-2 or the prehistoric H3 tephra without showing any signs of either *in situ* cultural deposit or the many later tephra post - dating the LNS. Similar results were provided by straightening of a 18 m long natural erosion face that runs diagonally across the surface of Area 5 (trench 1). The LNS could be followed fairly continuously across the trench 1 profile, though in places even this tephra was breached by erosion down to the H3 level. Wind transported deposits visible in the trench 1 profile ranged in size from silt up to 2 -3 mm diameter pebbles, suggesting the velocity and intensity of the erosion events that have flayed the site surface down to prehistoric levels over most of its surface. While bone was collected from the surface around the structures (Areas 3 and 4) and from the fill of trench 1 in area 5, none of these collections can be tied to a stratigraphic context and thus cannot be dated.

One of the cores near the South end of Area 5 transect showed around 5 cm of potentially *in situ* stratified cultural material, and a second test trench (4 x 4 m, trench 2) was opened around this core. A small deposit of mottled grey ash and fire -cracked stones with a heavy concentration of calcined bone was found *in situ* in an area extending ca 2 m x 0.75 m, with a depth of deposit ranging from 2-5 cm. This *in situ* midden material rested within 1 cm of the upper surface of the Landnám tephra sequence, representing evidence of very early deposition. The *in situ* deposit (context [002]) was 100% dry sieved (4mm mesh) as was the loose material directly above the [002] context, which probably derived from the same deposit, but which had been disturbed by erosion. While the middens once surrounding this highland site seem to have been almost completely destroyed by erosion, the small remaining deposit does serve to suggest some very early occupation, and has provided a small but quantifiable archaeofauna probably dating to the late 9th or very early 10th century AD.

Species Present

Table 1 presents the list of species present from the 2005 collection at SDM and for the combined 2004-05 surface collections from Undir Bálabrekku.

Table 1	NISP	Undir Sandmúla						Undir Balabrekku	
		Area 5	Area 5	Area 5	Area 5	Area 3	Area 4	Total	Total
Scientific Names	English Common Names	Trench 2 [002] Stratified	Trench 2 surface	Trench 1 surface	Trench 1 trench fill	surface	surface		surface
<i>Bos taurus</i>	cattle	104	15	2	5			126	23
<i>Equus caballus</i>	horse	3	2					5	1
<i>Canis familiaris</i>	dog	tooth marks						-	tooth marks
<i>Sus scrofa</i>	pig	6	1	1				8	
<i>Capra hircus</i>	goat							0	2
<i>Ovis aries</i>	sheep	6	2		1			9	5
<i>Ovis or Capra sp.</i>	caprine	358	42	19	10	1	5	435	32
	All Caprines	364	44	19	11	1	5	444	39
	All domestic	477	62	22	16	1	5	583	63
<i>Alopex lagopus</i>	arctic fox	2	1					3	
<i>Laridae sp.</i>	Gull sp.								1
<i>Aves sp.</i>	Bird egg shell					1		1	
<i>Salmonidae sp.</i>	Salmonid fish	1						1	
<i>Mya sp.</i>	Clam sp.	4						4	
<i>Mollusca sp.</i>	Shellfish sp.		2					2	
	total identified (NISP)	484	63	22	16	2	5	592 0	64
	Large terrestr. Mammal	67	12	2	1		1	83	12
	Medium terrestr. Mammal	817	112	35	26	1		991	22
	Unidentified fragments	3519	1397	44	32	14	10	5016	4
	total all fragments (TNF)	4887	1584	103	75	17	16	6682	102

The Area 5, Trench 2 [002] collection represents *in situ* deposits excavated with trowels and 100% sieved. The other collections represent hand-picking of bones exposed on the surface without any attempt at sieving. The [002] context produced nearly 500 identifiable fragments from a total of nearly 5,000 fragments, along with an

iron nail and attached rove and two semi-hemispherical bimetallic copper alloy / iron objects, probably decorative nails or studs. Many small flecks of wood charcoal and many fist-sized fire damaged stones were also present in the [002] deposit. The layer closely resembled very similar "fireplace cleaning" deposits (high percentage of burnt bone, fire damaged stones, ash and charcoal) encountered regularly in other Viking age- early Medieval midden deposits in Iceland.

Taphonomic Issues- Limits of Comparability

While the stratified [002] context produced enough mammal bone to pass the NABO Zooarchaeology Working Groups threshold for comparability (>300 NISP), it derives from a badly damaged site, where most surface bone was either burnt white (calcined) or bleached and disintegrating. The context itself is limited to an area of a few square meters of surviving ash/charcoal "fireplace cleaning" deposit, probably not fully representative of the originally rich, diverse, and extensive midden deposits. While much mammal bone survives combustion while retaining identifiable morphology, almost all fish, bird, and shellfish bone is completely destroyed. One small fragment of burnt freshwater fish (salmonid, probably trout or charr) vertebrae in the [002] collection is

thus probably the last survivor of what may have been a great many more non-mammalian fragments.

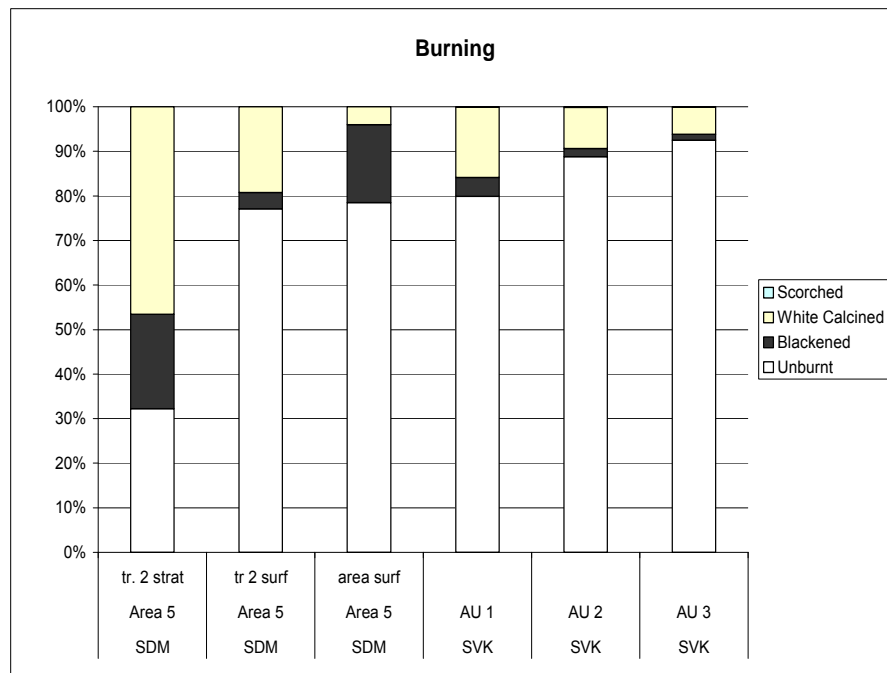
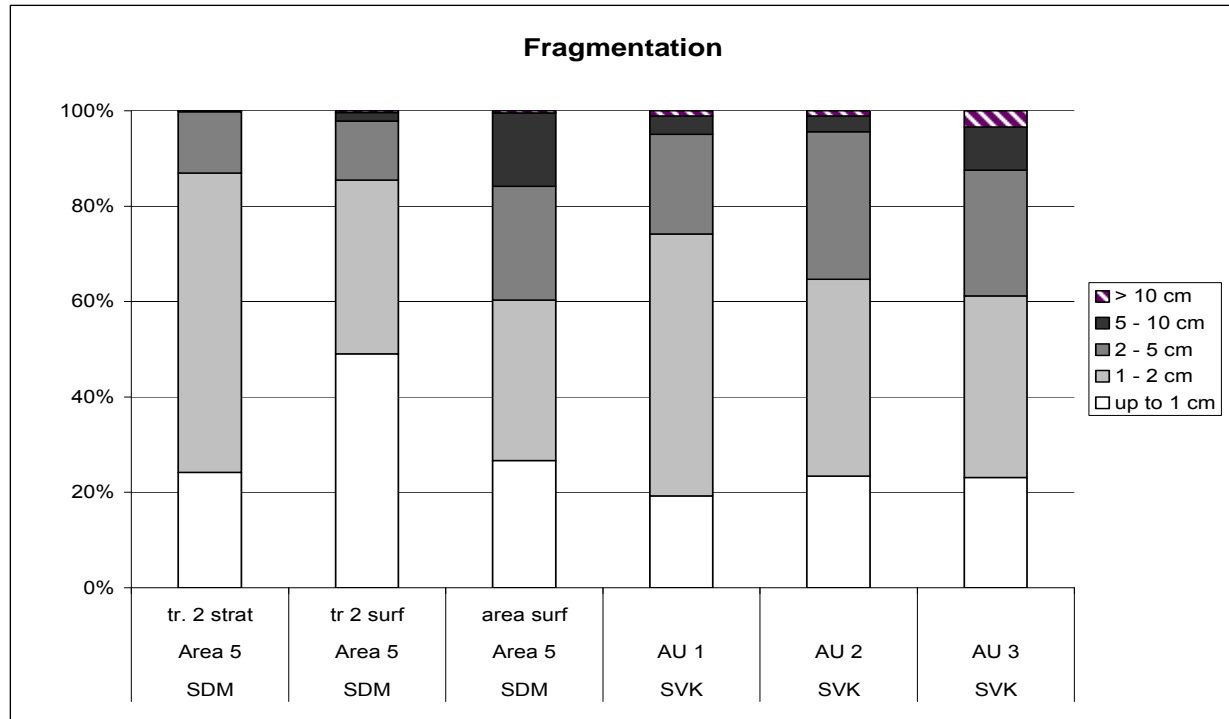


Figure 2 presents the relative proportions of white burnt (calcined), blackened, lightly scorched and unburnt bone from the stratified [002] context at SDM with the hand collected surface bone from Area 5. Three sieved stratified phases from the Mývatnssveit site of Sveigakot (SVK) are

included for comparison. The stratified SDM material clearly contains a particularly high concentration of burnt bone relative to the Sveigakot phases (which include many "fireplace cleaning" deposits similar to SDM [002] combined with other less combusted midden deposits).

"Fireplace cleaning" deposits tend to also show high degree of bone fragmentation, as calcined bone has been effectively de-collagenated and reduced to the inorganic calcium and hydroxyapatite mineral components which easily shatter like glass into many small fragments. Figure 3 presents the fragmentation pattern for the three major SDM contexts and the same reference phases from Sveigakot used above. The SDM context [002] fragments group in the lower end of the size ranges (>2 cm) and lack many large or complete bone elements.



These taphonomic factors limit the comparability of the SDM stratified [002] context, and unquestionably it would have been helpful if the one surviving *in situ* deposit were not so heavily burnt. It would be unwise to make use of the [002] SDM collection in full-collection comparisons with archaeofauna such as the Mývatn sites, and we cannot know if the SDM occupants made extensive use of fish or birds from present evidence. We are also limited in our ability to reconstruct domesticated herding patterns or reconstruct stock size ranges due to the fragmented nature of our domestic mammal bone collection. However, while accepting these limitations, the SDM stratified archaeofauna does have a role in carefully structured inter-site comparisons, and can still shed light on the early economy of the Icelandic interior.

Species Present

Despite taphonomic issues, the list of taxa present in the archaeofauna from SDM and Undir Bálabrekkju indicate the presence of the full range of what we now recognize as the "Landnám package" of cattle, sheep, goats, horses and pigs. These species appear in both the stratified and surface collections, suggesting that these deep interior sites were probably full farms rather than specialized sheep herding stations. Dogs are represented (as usual) by their tooth marks on other species' bones. The presence of

arctic fox bones in the stratified context as well as surface collection suggests that fox were hunted as in Settlement Age Mývatnssveit. The use of marine resources and the degree of contact with the coast are unanswered questions, as the clam shell fragments could come from shells retained as spoons or scoops, and the single sea gull bone could come from a wandering individual. Due to the nature of the SDM deposits, we can say little about whether and to what extent the settlers participated in the inter-regional interior distribution of marine fish, sea mammals, sea birds and sea bird eggs documented for Mývatnssveit, Granastaðir in inland Eyjafjord, or Reykholt.

Domestic Mammals

We can make fuller use of the domestic mammal bone from SDM. Table 3 presents a broad comparison (% NISP of domestic mammal bones) for the stratified [002] context at SDM and the sites of Sveigakot (SVK), Hrisheimar (HRH) and Hofstaðir (HST) in the Mývatn region.

Table 3	SDM	SVK	SVK	SVK	HRH (prel.)	HST	HST
		Late	Mid-			Mid-	
<i>Domestic Mammals %</i>	9th-10th?	9th-10th	Late 10th c	L. 10th-E. 11th	Mid 10th c-E. 11th	Late 10th c	L. 10th-E. 11th
	<i>[002] Stratified</i>	<i>AU 1</i>	<i>AU 2</i>	<i>AU 3</i>	<i>upper</i>	<i>AU 3</i>	<i>AU 4</i>
Cattle	21.80	35.76	23.06	21.04	17.00	21.78	24.56
Horse	0.63	0.15	1.29	0.14	0.25	0.33	0.86
Pig	1.26	7.99	7.46	0.79	21.15	3.49	4.50
Caprine total	76.31	56.10	68.19	78.03	61.60	74.40	70.08
					HRH (prel.)	HST	HST
	SDM	SVK	SVK	SVK		Mid-	
		Late	Mid-			Late	
	9th-10th?	9th-10th	Late 10th c	L. 10th-E. 11th	Mid 10th c-E. 11th	Late 10th c	L. 10th-E. 11th
	<i>[002] Stratified</i>	<i>AU 1</i>	<i>AU 2</i>	<i>AU 3</i>	<i>upper</i>	<i>AU 3</i>	<i>AU 4</i>
Caprine/Cattle ratio	3.5	1.6	3.0	3.7	3.6	3.4	2.9

Figures 4 and 5 graph these data, providing a comparison of relative proportions of major domestic mammals and a direct ratio of all caprines (sheep and goat combined) with cattle bones. While immature bones are particularly subject to combustion and other forms of attrition, a few new born cattle bones were recovered from the SDM stratified contexts, suggesting connections to the better documented dairy economies of contemporary Settlement age sites.

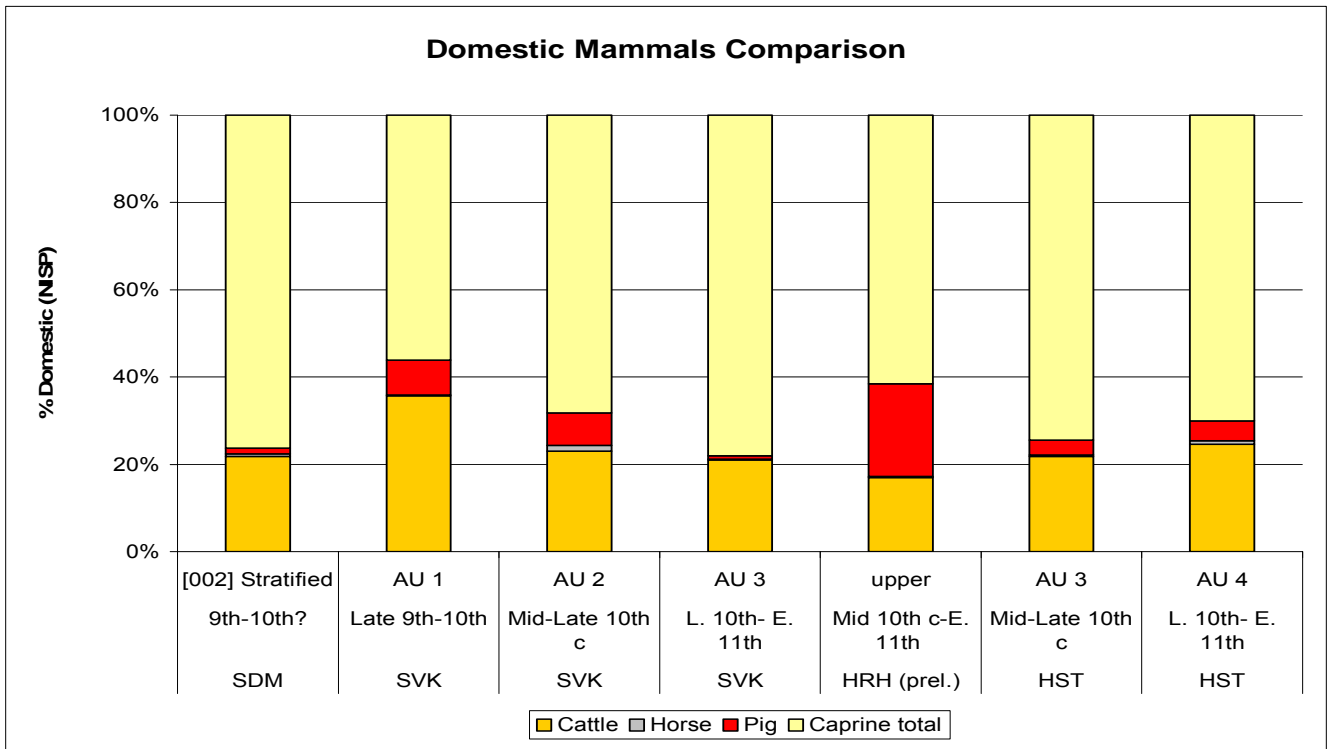


Figure 4

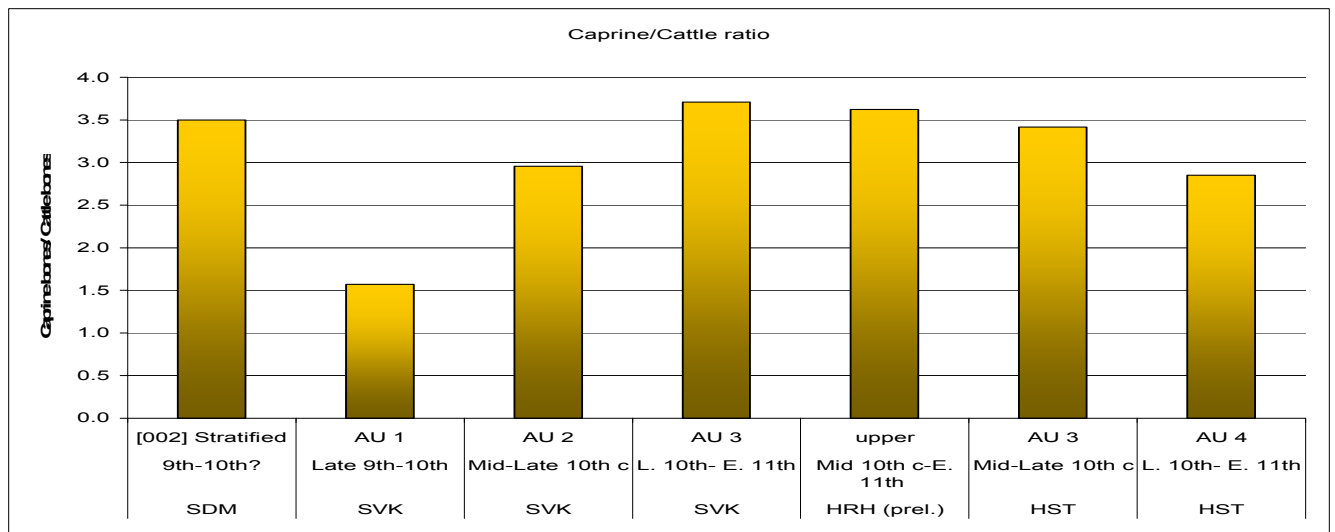


Figure 5

Discussion

These broad comparisons with near contemporary northern Icelandic sites may help place the SDM archaeofauna in perspective, and help to test some competing hypotheses about the economy of this inland site at first settlement:

- *Far inland sites were not managed as full scale permanent farms, but were large versions of later seasonal herding camps.*
- *If far inland sites were permanent farms, they still must have been managed for primarily for sheep production and should show very high ratios of caprines relative to cattle, perhaps similar to the 20:1 ratios common in later medieval and early modern N Iceland.*
- *Far inland farms were managed comparably to contemporary farms closer to the coast, such as the Mývatnssveit late 9th – early 11th century sites.*

As we have seen, the substantial amounts of cattle bone (including both adults and neonatal animals) and the presence of pig and horse bone recovered from SDM indicates the presence of the full range of domesticates that could be expected from a typical 9th-11th c Settlement age farm. This does not support the first hypothesis, which is also not supported by the substantial hall ruin and other structural indications of a permanent farm at the site.

As Figures 4 and 5 indicate, a direct comparison with the more contemporary late 9th-early 10th c phase at Sveigakot indicates significantly more pig and cattle at early Sveigakot than in the SDM archaeofauna, which may well represent adjustment to local environmental potentials at first settlement (recent environmental models by Andy Casely suggest some woodlands along the Skjálfandafljót river and probably extensive grasslands in the uplands around SDM, while it is likely that early Sveigakot was in a fairly dense woodland bordering wet meadows). However, there is no indication of a radically different management strategy of domestic mammals at SDM from the broader range of near contemporary N Icelandic sites. The direct caprine/cattle bone ratio contributes to this picture, placing the early SDM ratio (about 3.5 caprines per cow bone) in the same range as the later phases at Sveigakot, the current Hrisheimar collection, and the earlier phases at Hofstadir. While the SDM collection leans towards sheep, it is by no means so sheep dominated as the post -1200 AD Mývatnssveit archaeofauna. Within the constraints imposed by taphonomy and time, the Undir Sandmúla stratified archaeofauna indicates broad similarity with what we know of Settlement age farming strategy, and tends to support the third hypothesis.