An Early 13th c Archaeofauna from Steinbogi, Mývatn District, Northern Iceland

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DRAFT 2 NORSEC Laboratory Report No. 13

February 2nd 2004

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A product of the North Atlantic Biocultural Organization (NABO) Research Cooperative and the Leverhulme Trust Project Landscapes Circum Landnám

Abstract

In 2002 a rescue excavation of the small site of Steinbogi in the Mývatn district of N Iceland produced an archaeofauna datable to the late 12th-early 13th c. This collection at present is the only quantifiable archaeofauna in this time period for the district, and provides important comparative material for both the older 9th-11th archaeofauna from the region and the better documented early modern period. The collection was dominated by caprines, nearly all of whom were probably sheep, and pig and horse consumption appears to have halted by this date. Both local freshwater fish and imported cod-family fish were exploited and small numbers of birds were taken. The collection appears to represent a transition between trends visible in the early 12th c archaeofauna and the record of early modern agricultural practice in Mývatnssveit.

Keywords: Iceland, Zooarchaeology, Medieval, North Atlantic.

Midden Excavations at Steinbogi 2002

During the 2002 field season of the *Landscapes of Settlement Project* (directed by ***Fornleifastofnun Islands*** with collaboration by the NABO cooperative) the CUNY team was tasked to locate and excavate midden deposits associated with the small abandoned farm Steinbogi in Mývatn district (28 W 0399697, UTM 7276512, ca 280 m asl). The site overlooks the Laxá river with a direct view of the Hofstaðir estate to the north, and occupies a steep but grassy slope that shows evidence of extensive turf cutting (figure 1). The site includes a well preserved boundary dyke and a complex of stock buildings dating to the early Middle Ages were excavated FSI teams prior to their removal by highway construction (Edvardsson 2002). The midden team located an extensive midden deposit up to 75-80 cm thick in front of what appears to be the main house mound. A 3 x 3 m midden unit K was begun, and carried through to subsoil in a small 25 cm x 1 m *sondage*. Significant amounts of well preserved animal bone were collected, along with artifacts suggesting a medieval date for the majority of the deposit (including the games piece made from a haddock cleithrum illustrated in figure 2). All excavated soil was dry sieved through the standard 4mm mesh used in the *Landscapes of Settlement* project, with an approximate 3% retained as whole soil samples for later flotation. The midden is not deposited upon an undisturbed natural surface, but rests on a surface disturbed by extensive earlier turf cuttings that have been carried to the surface of the prehistoric H3 tephra. There are no other *in situ* tephra visible, even the thick 1477 tephra seems to have been removed by later

turf cutting. While the farm itself may extend to the Viking age and have been occupied later than the high Middle Ages (it is not listed as occupied in the 18th c Jardabok), the animal bone collection reported here thus comes from only a fairly narrow temporal horizon and does not represent a continuous record of economic change at this small farm. However, the substantial archaeofauna collected does allow for a useful reconstruction of patterns during one phase of the occupation of Steinbogi and provides a solid basis for comparison with other archaeofauna recovered from the area.

Dating

Volcanic tephra normally helpful in dating Mývatnssveit sites had been removed both below and above the bone-bearing layers at Steinbogi by turf cutting. The gamesman illustrated above resembles post-crusade chess pieces common throughout Europe in the 12th-13th c more than one of the older Viking age gamesmen recovered from 10th-11th c deposits at Sveigakot and Hofstaðir. Unlike wooden or ivory continental examples, this gamesman was not turned but instead carefully hand-carved to resemble a lathe-turned figure. A 2 cm long segment of a single sided composite comb plate was also recovered, and would be conventionally dated to before AD 1200 in Scandinavia, but the small size and abraded edges of the fragment recovered suggests the possibility of residuality or redeposition. Other finds included whetstones, worked bone, and iron objects with wide chronological span of use.

Two neonatal cattle bones from the same context (002) were submitted for AMS radiocarbon assay to the SURRC laboratories in East Kilbride, and the results are presented in table 1 below.

Lab Reference #	13C/12C ratio	radiocarbon age	Calibrated 1 Sigma	2 Sigma
STEINBOGI AA-52498 (GU-9737)	-21.40%	875+/- 40 BP	AD 1150-1220 (43.9%),1040-1090 (15.2%), 1120-1140 (9%)	AD 1030-1260
AA-52499 (GU-9738)	-20.50%	870+/-40 BP	AD 1150-1230 (47.5%), 1120-1140 (8.5%), AD 1060-1090 (12.3%)	AD 1030-1260

These closely consistent radiocarbon dates suggest an occupation spanning the late 12th-early 13th c. As stratigraphy suggests that the excavated midden deposit was created over a fairly short period, it seems reasonable to treat the contexts as a single analytic unit datable to the years on either side of AD 1200.

Laboratory Methods

Analysis of the collection was carried out during November-December 2003 at the Brooklyn College and Hunter College Zooarchaeology Laboratories and made use of extensive comparative skeletal collections at both laboratories and the holdings of the *American Museum of Natural History*. All fragments were identified as far as taxonomically possible (selected element approach not employed) but most mammal ribs, long bone shaft fragments, and vertebral fragments were assigned to "Large Terrestrial Mammal" (cattle-horse sized), "Medium terrestrial mammal" (sheep-goat-pig-large dog sized), and "small terrestrial mammal" (small dog-fox sized) categories. Only elements positively identifiable as *Ovis aries* were assigned to the "sheep" category, with all other sheep/goat elements being assigned to a general "*caprine*" category potentially including both sheep and goats (only one goat bone was in fact positively identified from this collection). Fish identifications follow the most current *ICAZ Fish Remains Working Group* recommendations, with only positively identified fragments being given species level identification (thus creating the usual large cod-family or salmon-family categories as well as a substantial number of unidentified fish bones). Following NABO Zooarchaeology Working Group recommendations and the established traditions of N Atlantic zooarchaeology we have made a simple fragment count (NISP) the basis for most quantitative presentation. Measurements (Mitoyo digimatic digital caliper, to nearest mm) of fish bones follow Wheeler & Jones (1989), mammal metrics follow Von Den Dreisch (1976) and mammal tooth eruption and wear recording follows Grant (1982). Digital records of all data collected were made following the 7th edition NABONE recording package (Microsoft Access database supplemented with specialized Excel spreadsheets, see discussion and downloadable version at www.geo.ed.ac.uk/nabo) and all digital records (including archival element by element bone records) and the bone samples are permanently curated at the *National Museum of Iceland*. CD R versions of this report and all archived data are also available on request from nabo@voicenet.com.

Overview of Species Present

Table 2 provides an overview of the Steinbogi archaeofauna including both identified (NISP) bone fragments and those that could only be identified by family and general size range. "Large terrestrial mammals" are cattle/horse sized fragments, "Medium terrestrial mammals" are sheep/goat/pig/large dog sized fragments, while "unidentified mammal fragments" are bits of bone scrap identifiable only as mammalian. While the collection is not as large as those currently excavated from Sveigakot and Hofstaðir, it is well above the informal NABO quantification threshold of 1,000 NISP and appears to present internally consistent patterning. As is usual with sieved collections the majority of the bone fragments were too small to assign to useful taxonomic level, but most clearly derived from the domestic mammals whose remains make up most of the identified fragments.

Table 2

Domestic Mammals	1,083
Cetacea	1
Birds	59
Fish	151

Mollusca	8
TOTAL NISP (Identified fragments) =	1,302
Medium Terrestrial Mammal	1,381
Large Terrestrial Mammal	27
Unidentified Mammal Fragments	4,165
TOTAL TNF (all fragments) =	6,875

Taphonomy

Tables 2-4 summarize the evidence for some of the many taphonomic forces that differentially affect the survival of animal bone in different archaeofauna (Lyman 1994) and provide a comparison between the Steinbogi collection and with archaeofauna from Finnbogastaðir (rural 18th c site), from Tjarnargata 3 c in downtown Reykjavík (proto-urban 18th-early 19th c site), and from Sveigakot in Mývatnssveit (rural mid 10th c site) all analyzed by the same team and recorded using the same methods (Edvardsson et al 2004, Perdikaris et al 2002, McGovern in Vésteinsson 2003). Bone fragmentation categories (table 2) are closely similar in the three rural sites, with most bone fragments clustering in the 1-5 cm size range. The presence of a higher proportion of larger bones in the urban context of Tjarnargata 3 c may reflect a somewhat less complete processing for marrow extraction.

Table 2	Finnbogastaðir		Tjarnargata 3 c		Steinbogi		Sveigakot "M"	
Fragment size	Count	%	Count	%	Count	%	Count	%
Up to 1 cm	1,450	19.55	208	6.14	1,258	18.46	1,505	20.65
1 cm- 2 cm	2,605	35.13	423	12.49	3,037	44.56	3,240	44.45
2 cm-5 cm	2,606	35.14	1,146	33.84	1,924	28.23	2,247	30.83
5 cm-10 cm	660	8.9	1,117	32.98	495	7.26	225	3.09
>10 cm	94	1.27	493	14.56	102	1.50	70	0.96

Table 3 presents the relative proportions of burnt and unburnt bone fragments of all taxa from the same four sites. In this case the Settlement age site of Sveigakot shows a higher percentage of burnt bone (especially of white calcined bone exposed to the most prolonged intense heat) as well as a higher overall proportion of burnt bone (ca 18% vrs 2-5% of total). This pattern is consistent in comparisons of all early (9th-11th c) Icelandic sites with later medieval and Early Modern collections. One possible explanation is a change in hearth form and location interacting with patterns of domestic refuse disposal. In much of the N Atlantic centrally placed open long fires were replaced by much more formally constructed ovens placed in corners during the 12th c (Bigelow 1985). It is possible that as it became less convenient for diners to toss bones directly into the open fire the proportion of strongly burnt bone declined. Perhaps significantly, far less fire cracked rock was observed during excavation at Steinbogi than at the 9th-12th c sites in Mývatnssveit, suggesting that a transformation in cooking practices and foodways from the Settlement Age may have already taken place.

Table 3	Finnbogastaðir		Tjarnargata 3 c		Steinbogi		Sveigakot "M"	
Burning	Count	%	Count	%	Count	%	Count	%
Unburnt	7,146	96.39	3,135	92.56	6,694	98.21	5,005	81.42
Blackened	26	0.35	114	3.37	31	0.45	157	2.55
White (calcined)	242	3.26	79	2.33	91	1.34	971	15.8
Scorched	-	0	59	1.74			14	0.23

Table 4 presents the frequency and type of animal tooth marks observed on bone fragments from Steinbogi and our comparative archaeofauna. As usual, most bone fragments show no definite tooth marking, and what marks there were at Steinbogi were characteristic of canid gnawing presumably by domestic dogs. In Greenlandic archaeofauna, up to 30% of bone fragments show dog tooth marks, suggesting some significant differences in dog numbers and management in these two medieval Scandinavian settlements.

Table 4	Finnbogastaðir		Tjarnargata 3 c		Steinbogi		Sveigakot "M"	
Gnawing	Count	%	Count	%	Count	%	Count	%
None	7,365	99.81	69,426	99.94	6812	99.94	7,275	99.81
Dog	11	0.15	27	0.04	4	0.06	14	0.19
Rodent	2	0.03	13	0.02	-		-	
Dog & Rodent	1	0.01	2	0.01	-		-	

Domestic Mammal Relative Abundance

Domestic mammals make up the majority of the bone fragments, and almost certainly also comprise most of the fragments only identified as medium or large terrestrial mammal. Table 5 presents the NISP counts and relative percentages of these species. Note the absence of pig and horse bones, both present in substantial numbers in earlier archaeofauna from the district.

Table 5

Scientific Names	*English Common Names*	*NISP Count*	*% Domesticates*	
Bos taurus	Cattle	47	4.34	
Equus caballus	Horse	0		
Canis familiaris	Dog	xx		present, canine tooth marks
Sus scrofa	Pig	0		
Capra hircus	Goat	1	0.09	
Ovis aries	Sheep	163	15.05	
Ovis or Capra sp.	Caprine	872	80.52	

Total	1083

As the table indicates, the Steinbogi domestic mammals were dominated by Caprines, which were nearly all sheep. Unlike the 9th-12th c Mývatn archaeofauna, horse bones and pig bones are completely absent. The ratio of cattle to caprine bones in the collection is approximately 1: 22. In 1710, the mean cattle to caprine ratio for all of Mývatn was approximately 1:24, and the district had become known as a sheep raising region.

Figure 3 presents a comparison of this caprine to cattle ratio for a series of archaeofauna from Iceland, arranged from the earliest (late 9th-early 10th c) collections down to the 11th-12th c archaeofauna, with Steinbogi, two high medieval layers at Svalbarð in and the mean of the Jarðabók Mývatn farms on the far right (higher bar indicates relatively more caprines).

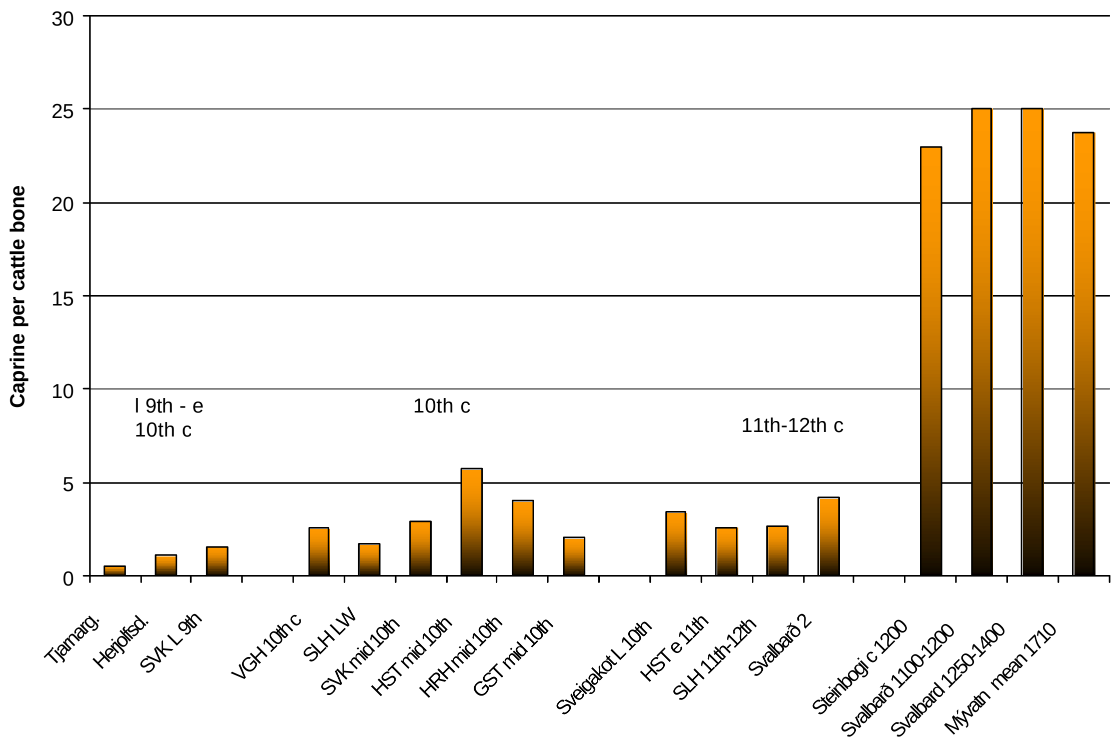
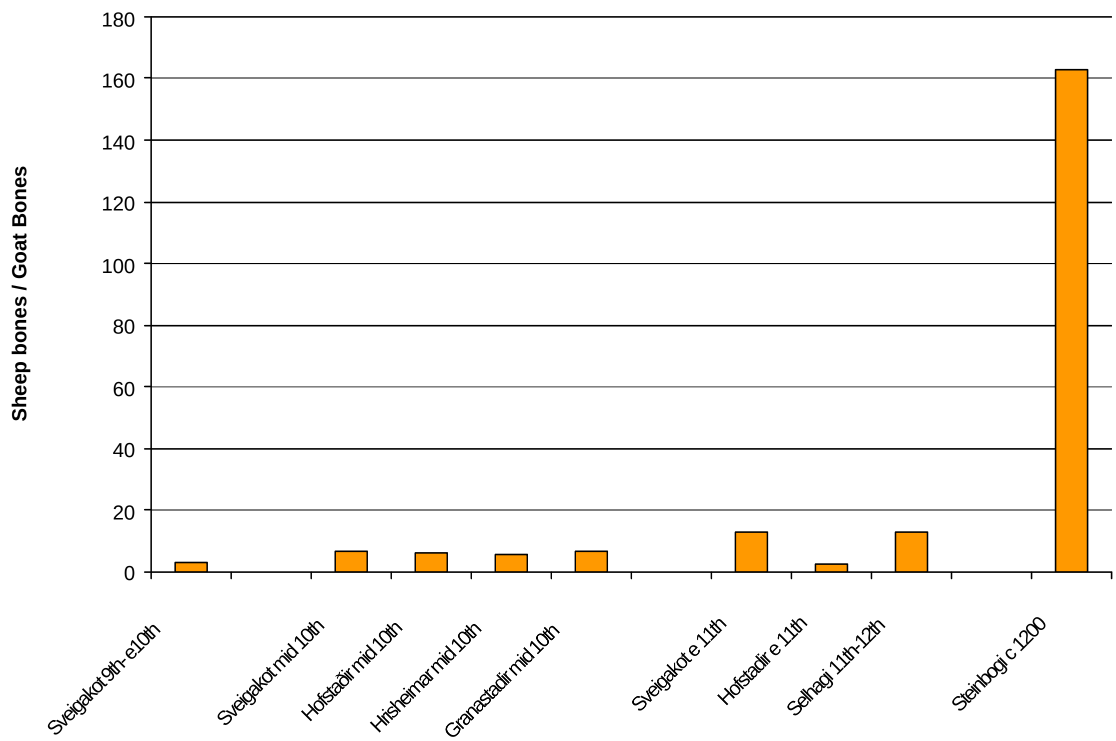


Figure 3

As the graph illustrates, most pre-13th c sites in both N and S Iceland had caprine to cattle ratios somewhere between two caprine per cattle up to about six caprines per cattle bone. After ca AD 1200 in Northern Iceland (but not in the south) there is a sharp alteration in relative proportions of what had become the two main domestic mammals. The caprine to cattle ratio of Steinbogi thus is profoundly different from earlier farming patterns in the district, but falls squarely within the pattern of later medieval Svalbarð farm and the 18th c land register data.

The ratio of sheep bones to goat bones also appears to undergo a major shift by the time of the Steinbogi deposits were created. Figure 4 illustrates the shifting ratios of sheep to goats (higher bar is relatively more sheep) in our available N Icelandic collections for this period. While the graph is something of a statistical artifact (a single goat bone was identified vrs 163 sheep at Steinbogi), it does make clear that the trend noticeable at the site of Sveigakot of steady increase of sheep relative to goats ca. 875-1100 (from about 2 : 1 to 13 :1) continued into the 13th c. By the 18th c, a few goats continued to be kept in the Mývatn district, but sheep completely dominated the caprine species as in the rest of early modern Iceland. Again, it would appear that stock keeping trends typical of later history in the region are already present at Steinbogi.



Age Reconstruction of Domestic Stock

Neonatal Bone Fragments

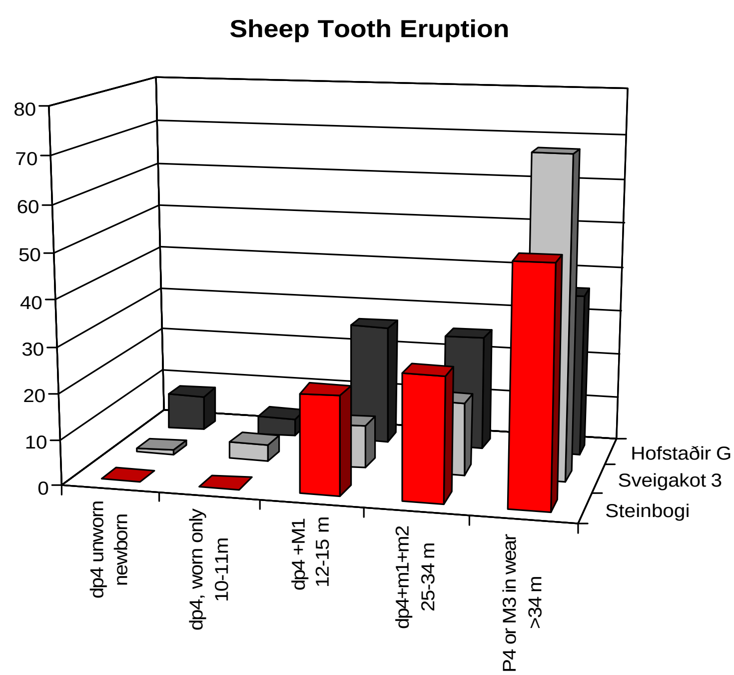
The zooarchaeological investigation of past farming strategies involves both assessment of the relative abundance of bones of different taxa and (where possible) a reconstruction of the age of death of domestic stock. These reconstructed mortality profiles have traditionally been used to infer the harvest strategy of the ancient farmers and their intended animal products (milk, meat, wool, hides). One approach is to count the number of bones coming from clearly newborn or late fetal animals (neonatal) relative to adult and older juvenile bones. This only separates out the distinctive bones of the very youngest animals, but it has the advantage of including virtually all the bones of the skeleton rather than focusing upon selected elements or tooth rows (which are necessarily more rare). Table 6 presents the relative percentages of these neonatal bones for cattle and caprine at Steinbogi. While sample size for cattle bones is only moderate, the typical contrast between high rates of neonatal death in cattle and low rates in sheep is evident. As Halstead (1998) has argued, such patterns can usually be interpreted as reflecting a dairy cattle herding pattern.

Table 6 Neonatal bone	Count	%
Cattle	11	23.40
Caprine	12	1.16

Cattle tooth rows are entirely absent from the Steinbogi collection, making it impossible to attempt to infer age of death from tooth eruption or wear. Similarly there are too few intact long bone ends to allow useful reconstruction of proportions of fused or unfused epiphyses (though at least one cow survived to see its distal tibia fuse at ca 3.5-4 years). Sheep bones are far more abundant in the Steinbogi collection and permit some age reconstruction based on dental eruption, tooth wear, and long bone fusion rates.

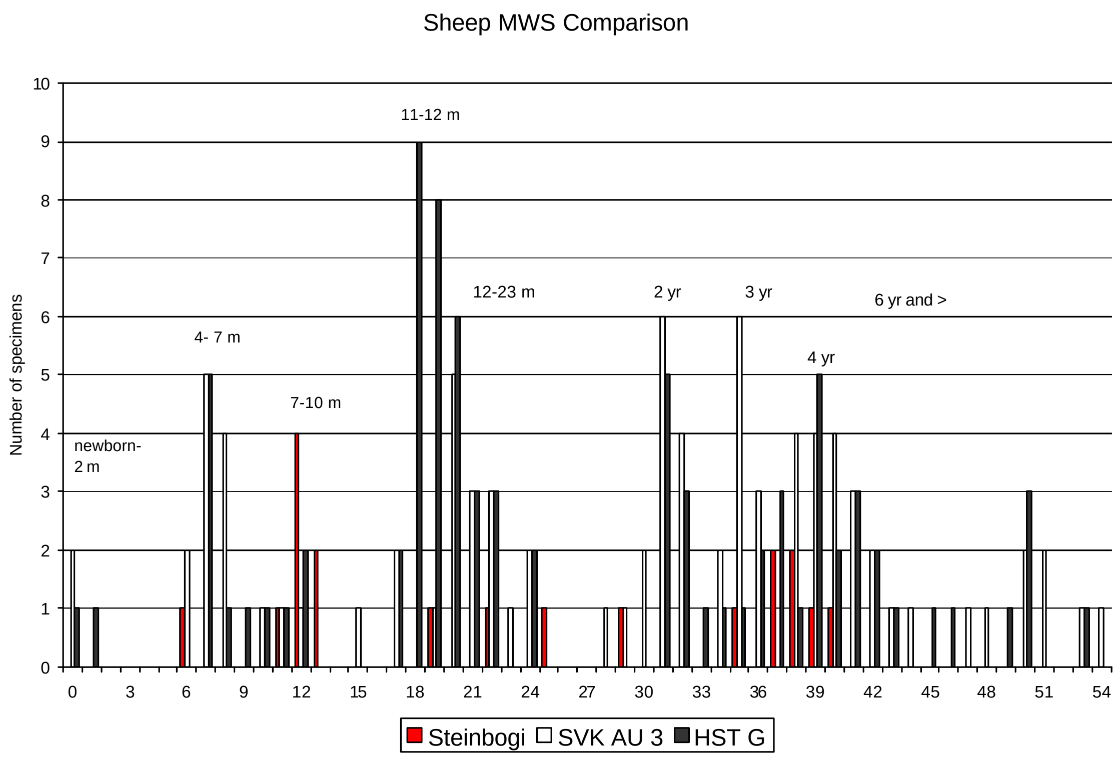
Sheep Tooth Eruption & Wear

While breed, nutrition, and general health affect the rate of tooth eruption in individual animals, the general pattern of eruption is fairly stable and well documented for Icelandic sheep. Figure 5 illustrates the pattern of sheep tooth eruption at Steinbogi (n=37, maxillae and mandibles) and compares it to patterns at the earlier nearby sites of Sveigakot and Hofstaðir.



At all three sites, the majority of the sheep appear to have survived to experience the eruption of their adult dentition, though some were clearly culled in their first two years of life.

Using the widely employed method of Grant (1982) it is possible to score both individual teeth and partial tooth rows for wear. While tooth eruption sequences have a strong genetic basis, tooth wear is conditioned by both age and the amount of grit present in fodder (Mainland 2001) and is thus a less direct measure of actual age of death. Figure 6 presents the mandibular wear stage (MWS) distribution (age assignments and approach follow Enghoff 2003). While the small number of usable mandibular tooth rows (n=16) limits conclusions, there appears to be a small spike in mortality in the 7-10 month range (ca Nov-Feb for early May births), and if tooth wear at Steinbogi were only slightly more rapid than at the earlier sites this minor spike could easily simply reflect the sort of autumn stock adjustment pattern evident in the larger Sveigakot and Hofstaðir collections.



If we focus upon wear to the deciduous fourth premolar (dp4) the smaller sample size (n=11) restricts generalizations, but the general pattern suggesting a peak in mortality in the autumn/late summer at all three sites may indicate the general similarity in sheep flock management during the first year of life (figure 7)

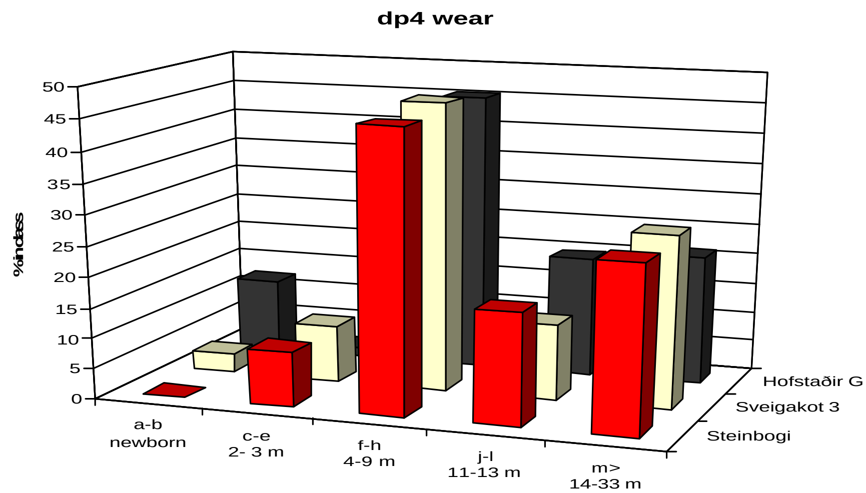


figure 7

Fusion of Caprine Long Bones

Figure 8 presents the fusion percentage of selected long bone ends, illustrating the fall off in the number of animals surviving past a particular fusion point. While epiphyseal fusion is somewhat variable among individuals and is conditioned by nutrition and health as well as by genetics, and the survivorship of particular bone elements is also conditioned by taphonomic factors, fusion rates can yield data that can supplement age reconstructions based on tooth wear and eruption (see Enghoff 2003).

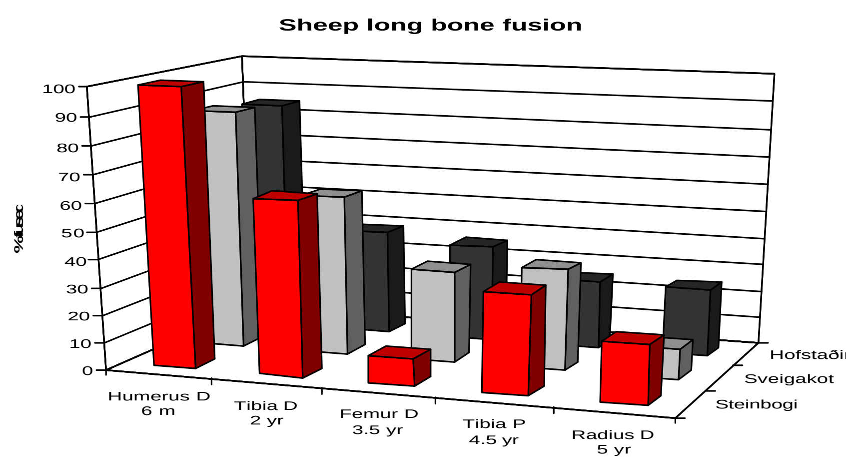


Figure 8

All three sites show much the same pattern, with the great majority of sheep surviving their first six months and substantial numbers (ca 20-30%) reaching 4.5-5 years. This long bone fusion pattern provides a useful supplement to the Steinbogi sheep mandible MWS pattern (figure above), which lacked jaws from older animals. These fusion data indicate that older sheep were in fact not uncommon at Steinbogi and there is no strong evidence for a herding pattern significantly different from the larger and older collections from Sveigakot and Hofstaðir. A larger collection would certainly be desirable, but overall patterning suggests a wool-producing economy also providing byproducts of meat and milk.

Size Reconstruction and Metric Data

Making use of the work of Teichart (1975) a reconstruction of estimated live withers height can be made based on the maximum length of selected long bones. Due to butchery practices and sample size, only two bones (metatarsus and radius) are available for GL (greatest length) metrics from Steinbogi (all measurements follow Von den Dreisch 1976). As table 7 indicates the two stature reconstructions fall well within the range established by the larger collections from Mývatnssveit and the range of modern Icelandic sheep.

Table 7 Reconstructed Stature

Metatarsus (GL x 4.54)	*n*	*mean*	*max*	*min*	*standard dev.*
Sveigakot	28	63.27	69.96	56.95	3.62
Hofstaðir	20	52.69	71.19	43.13	6.44
Hrísheimar	1	61.17			
Steinbogi	1	65.83			
Radius					
Steinbogi	1	60.53			

Following O'Connor (1989) a reconstruction of live body weight in kilograms for the six available distal sheep radii from Steinbogi are compared to sheep radii from Hofstaðir (n=8) and Sveigakot (n=9) in table 8. While none of these sample sizes are large, the reconstructed sheep (standing between ca 40 and 70 cm at the withers and weighing between 30 and 45 kg) show considerable similarity between sites of different periods in Mývatnssveit. The Mývatnssveit sheep stature reconstructions also overlap with most of the range (ca 72-53 cm) produced by Enghoff's (2003) thorough review of other N Atlantic Viking-medieval collections. While the reconstructed animals may appear somewhat light for their stature by modern standards, data collected in 1913 from a flock of 60 ewes in S Iceland produced a mean live weight of 31.5 kg with a minimum of 27.5 kg (Aðalsteinsson 2000).

Table 8 Reconstructed Sheep Body Weight in Kg
based on distal radius measurement
O'Connor (1989) wt in kg=1.79xBd (mm)-13.3

Steinbogi	Hofstaðir	Sveigakot
31	35	30
32	37	31
38	38	31
38	38	32
40	40	33
42	40	33
	40	34
	41	38
		40

Figure 8 compares the distribution of sheep metacarpus maximum distal breadth (Bd) for Steinbogi (n=5), Hrísheimar (n=7), Sveigakot (n=35), and Hofstaðir (n=16). As Enghoff (2003) has noted with reference to the distribution of the same measurement of sheep metacarpi at GUS in Greenland, there is a

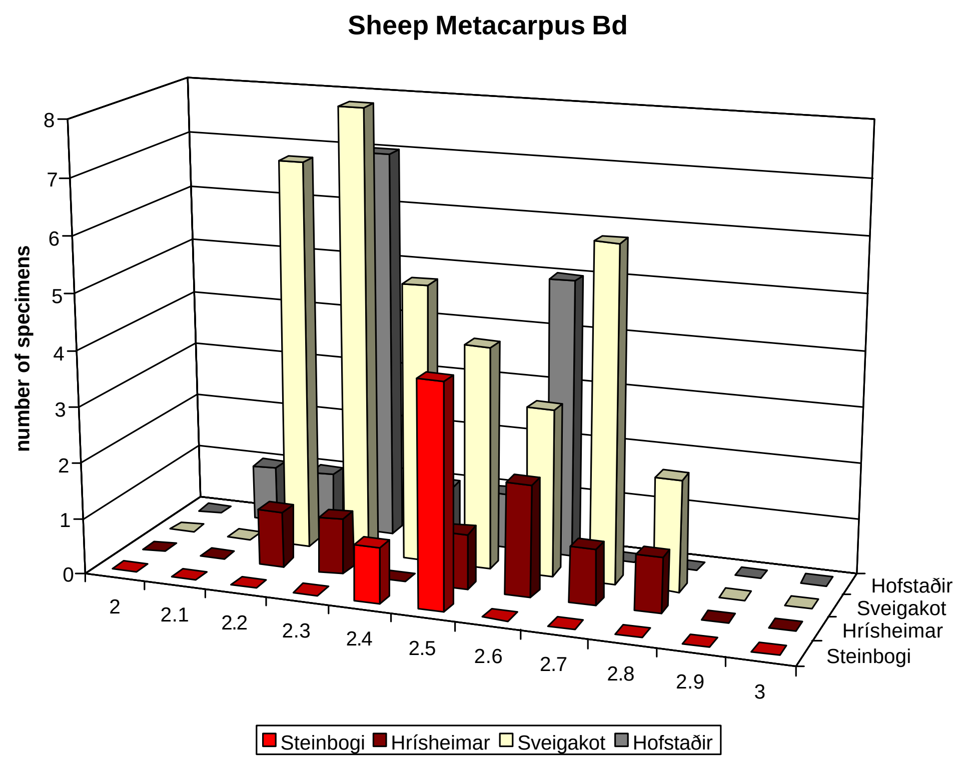


Figure 9

bimodality in the distribution of the larger collections (Sveigakot and Hofstaðir) which probably indicates sexual dimorphism (most likely ewes vrs wethers). All bone metrics from Steinbogi fall within the normal range for sheep previously documented from earlier periods in Mývatnssveit (see summary tables in appendix), and general conformation of skull shape and horn core strongly resemble both modern Icelandic sheep and the sheep of the 9th-11th c, supporting genetically based arguments for strong continuity of breed down to the present (Aðalsteinsson 1991)

Butchery Patterns & Bone working

The Steinbogi collection shows many similarities with patterns of butchery observed on other archaeofauna from the Mývatn area. One sheep skull was clearly prepared as *svið* (split sheep cranium) confirming the presence of foodways extending from earliest settlement down to the present (similar preparations have also been found in Norse Greenland). Long bones were generally split lengthwise (sometime with the aid of mid-shaft blows by a heavy instrument) for marrow extraction. All but one of the caprine metapodials recovered were subjected to longitudinal splitting (the usual method of the settlement age). This small proximal metatarsus fragment appears to show the sort of perforation found regularly in later medieval and early modern Icelandic and Shetlandic collections (and some Faroese), where most caprine metapodials were perforated at both ends so the marrow could be sucked out without destroying a very usefully-shaped bone (Bigelow 1984). It is unclear if this specimen actually represents such a dual-perforated metatarsal, as it appears to come from a bone that was also split longitudinally. The exact date for the introduction of biperforation into Iceland remains unknown, though it certainly becomes common on most sites by later 13th c.

The Steinbogi collection shows examples of bone and horn working as well as the marks of butchery and consumption. Two segments of a ram horn core (probably from different individuals) were recovered showing clear use of a saw to cut the horn and horn core into segments. The saw marks show a pattern of cutting from two directions and then snapping off the weakened center (common medieval practice) rather than cutting straight across as became common in early modern times. As figure 2 above illustrates, the dense cleithrum of the haddock was also used for carving. The 13th c carver at Steinbogi was part of a long craft tradition. Gamesmen carved from haddock cleithrum have been recovered from 10th c contexts in Mývatnssveit and modern carvers still work the same element into the images of birds and seals appearing in contemporary craft shops. The single fragment of whale (cetacean) bone appears to be a small fragment of a worked piece, possibly part of a broken tool, and need not reflect any subsistence role.

Birds

Bird bone makes up a small portion of the total archaeofauna at Steinbogi, and the identified fragments are split between ducks and ptarmigan (grouse). Despite the frequency of migratory waterfowl in the Mývatn/ Laxá area, most of the Mývatnssveit archaeofauna are dominated by ptarmigan, and this collection is the first from the region to show an absolute majority of duck bones. The Aythya sp elements are probably from the Scaup common to the Laxá near the site (tufted duck appears to be a recent arrival) but the Scaup cannot be reliably distinguished from this close relative on most elements. From the skeletal elements present and the find context, it is quite possible that the majority of the Aythya sp. bones come from a single individual, and larger samples from a wider area will be required to assess bird hunting at Steinbogi.

Table 9

Scientific Names	*English Common Names*	*NISP Count*	*% of Identified Birds*
Aythya sp.	Scaup/Tufted Duck	16	61.54
Anas platyr.	Mallard	1	3.85
Lagopus mutus	Ptarmigan	9	34.62
Aves sp.	Bird sp	33	
	Total	59	

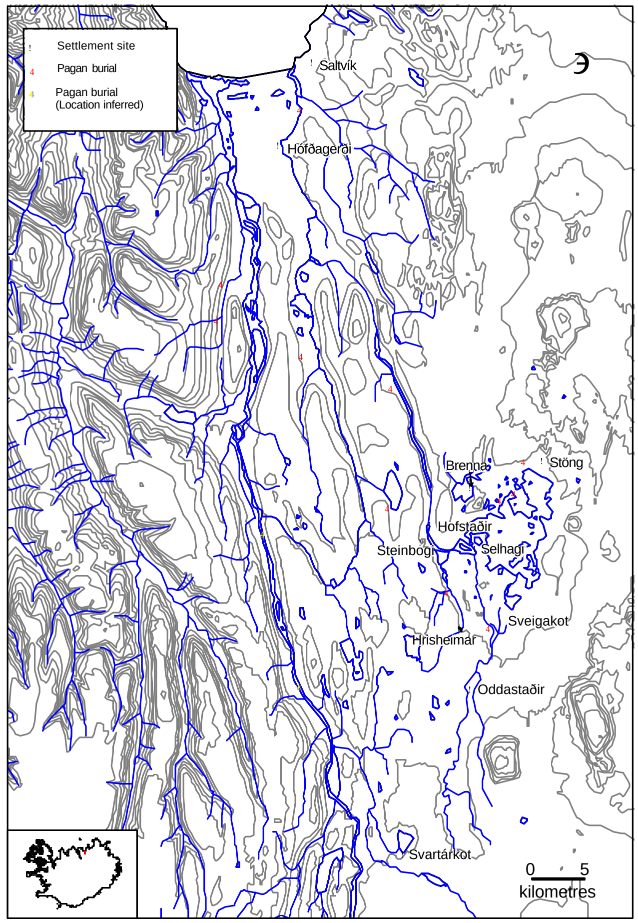
Fish

Table 10 presents the NISP count and relative percentage data for the fish remains recovered from Steinbogi. As the site overlooks what is today one of the richest trout fishing rivers in Iceland, it is not surprising to see salmonids and trout in particular dominate this part of the archaeofauna. Less expected would be the presence of gadid (cod family) fish given that Steinbogi is over 50 km from the sea. However, prior work on 9th-11th c collections from Mývatnssveit has regularly turned up significant amounts of marine fish bone in this inland area. As in prior bone assemblages, there is a marked difference in the skeletal element distribution of freshwater salmonids and salt water gadids (Perdikaris, Einarsson et al 2004). While the salmonids show representation of virtually all body parts, the gadid bones are restricted to the bones around the gill slit (cleithrum and nearby bones) and the lower (caudal) vertebrae. Heads and upper vertebral elements were apparently discarded at distant fish processing centers. Larger sample sizes will be required to assess any changes in this pattern of marine fish preparation from early settlement times down to the 13th c.

Table 10

English Common Names	***Scientific Names***	NISP	% all ID Fish	% of Family
Atlantic cod	*Gadus morhua*	11	9.32	52.38
Haddock	*Melanogramus aeglfinus*	10	8.47	47.62
Gadid family	*Gadidae sp.*	3	2.54	
Arctic charr	*Salvelinus alpinus*	9	7.63	16.98
Trout	*Salmo trutta*	44	37.29	83.02
Salmonid family	*Salmonidae sp.*	41	34.75	
Fish species		33		
	total	151		

Discussion



The Steinbogi archaeofauna by itself represents a useful indicator of farming and subsistence at a small and ultimately unsuccessful farm of the Middle Ages in this region. In combination with the regional picture provided by the Landscapes of Settlement project, it provides a key transition from the increasingly well documented economy of the 9th-11th c and the economy of Mývatnssveit documented by the large collections from Sveigakot, Hrísheimar, Hofstaðir and the smaller samples from Selhagi (see location map, figure 10, Steinbogi emphasized). Like Hofstaðir, Steinbogi occupied the fringe of the Mývatn area, with excellent access to the western banks of the Laxá river. However, the steep slope at Steinbogi provides far less level ground than the broad and relatively flat Hofstaðir home field, and the site is very exposed to wind from the N and E. It is hard to imagine that this was ever a very high status farm, though its prosperity may well have undergone the same alterations as have been documented for the site of Sveigakot.

However, it seems clear that time as well as status separate the Steinbogi archaeofauna from the other Mývatn collections. The final phase at Sveigakot (probably early to mid 12th c) certainly represents the midden accumulation of what had become a small (and failing) farm, with a hall area reduced to nearly half its 10th c size (Vesteinsson et al 2003). However, the Sveigakot collection clearly belongs to the end of the Settlement Age- pigs are still present in some numbers, horse bones appear in middens with every indication of butchery and consumption, goats are not rare, and cattle bones still make up a substantial proportion of the collection. The Steinbogi collection was probably deposited less than a century after the terminal Sveigakot archaeofauna, but seems to reflect a radically different agriculture - pigs and horses absent, sheep totally dominant over goats, and cattle reduced to a fraction of their earlier importance. It would appear that a significant transition in economy and subsistence had occurred, and that the Steinbogi collection indeed belongs to a different age.

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