

# The taphonomy of ritual bone depositions

## An approach to the study of animal bones and ritual practice with an example from Viking Age Frösö, Sweden

### Abstract

In this paper an approach to studying ritual bone depositions by reconstructing the taphonomic history of the zooarchaeological remains is presented. By methodically examining the taphonomic evidence from the chain of events, from the selection of animals to the killing, from the processing and utilization of the carcass to the deposition of the bones, different stages of a ritual, such as animal sacrifice, can be studied and understood. A bone assemblage from a Viking Age cult place at Frösö church in Jämtland in central Sweden (late 10th–early 11th century AD) will serve as an example of the approach. The analysis shows that brown bear and piglets were specifically selected to be used in the rituals, while horses were not important sacrificial animals in the cult, as has otherwise been indicated by written sources. Seasonal analysis indicates that sacrifices took place at three periods of the year. Butchering marks reveal the intense utilization of the carcasses and that meat was consumed. Body part frequency shows that bears were treated differently from other species, which could be the result of an influence of Saami ritual practice. The bones were deposited on the ground beneath a birch tree and carcasses were not hung in the tree as some written sources indicate.

### Introduction

The practice of sacrifice can be described as a human behaviour to be found in one way or another in almost all societies, past and present.<sup>1</sup> Sacrifice is often an essential part of religious practice, but has also a substantial social importance. The study of ritual practice associated with sacrifice is thus of interest if we want to understand not only the worldview and beliefs, but also the social structures and life of past cultures.

The sacrifice of animals followed by consumption of meat and deposition of bones has a central role in rituals and religious practice in many societies. It is probably one of the most ancient of all ritual practices and the killing of a creature is in many societies the ultimate sacrifice. The sacrifice of an

animal is often a public event that is followed by the sharing of the meat and a feast, which often is of significant social importance.<sup>2</sup> It is thus obvious that osteological remains of sacrificed animals are an important source of information for behaviour and belief in past societies. The question is: how can we study bones from ritual depositions?

The most central problem associated with studies of bones from ritual contexts is how to define and identify a ritual deposition and how it differs from bones from other kinds of contexts. The prevailing view among scholars today is that in prehistoric and ancient societies no sharp dividing line between the sacred and the profane existed. What we today in a secularized Western worldview may describe as religious or supernatural experiences or activities were in many past societies integrated in everyday activities.<sup>3</sup> It is not appropriate to separate animal offerings from subsistence strategies, since sacrificial killing most likely in many past societies were embedded in the animal husbandry practice. Most of the slaughter and killing of animals has also in some societies been ritualized, such as the Jewish *kosher* or traditional slaughter in Nordic countries during the 19th century.<sup>4</sup>

In this study sacrifice is defined as the killing of animals at certain occasions in order to communicate with the divine world and in distinction to slaughter in subsistence with the primary purpose to transform an animal into food. However, this does not mean that only the killing was significant in animal sacrifice. Just as important were the consumption of meat and the handling of the carcass and bones in the communication with the gods or spirits. Further, this does not exclude that ordinary slaughter was accompanied by rituals or should be understood as profane act, but the primary purpose of the killing and processing of the carcass was not religious in these

<sup>1</sup> Grant 1991; O'Day *et al.* 2004; Berggren 2006, 304; Pluskowski 2011.

<sup>2</sup> Twiss 2008, 423.

<sup>3</sup> Brück 1999; Insoll 2004; Bradley 2005.

<sup>4</sup> Cope 2002; Heurgren 1925, 357–377.

cases. In many ancient cultures slaughter was most likely not a case of either a sacred or profane act, but rather a matter of a gradient of sacredness depending on different factors, such as which kind of animal was killed, by whom, where and when the slaughter took place. There are examples of societies where all slaughter took place at certain occasions and all killing of animals could be described as sacrifices.<sup>5</sup> However, in many other societies like Iron Age Scandinavia and ancient Greece there was a distinction between ordinary slaughter and the killing of animals at certain occasions and places.<sup>6</sup>

In this study, the term ritual bone deposition will be used in relation to osteological evidence interpreted to result from handling and use of animal or human remains in the practice of religion or magic according to a structured and repeated pattern that differs from the deposition of ordinary refuse from butchering and meals.

Several studies have dealt with ritual bone depositions and different criteria have been proposed.<sup>7</sup> The definitions may differ as to what allows a bone deposition to be interpreted as the remains of a ritual activity. Identifications of ritual bone depositions are often based on the composition of species and body parts. Just as important is the archaeological context, i.e. how the bones were treated and arranged, and in which setting the bones were placed. In some cases the identification of ritual bone depositions is more obvious, such as depositions in graves or at altars of temple areas, but other cases such as depositions in pits are more problematic. A problem with strict definitions of ritual bone depositions is that they are too specific and focus on the odd, such as presence of human remains, complete carcasses and more unusual species.<sup>8</sup> Most ritual activities most likely involved the most common animals and usually the carcasses were processed and the meat consumed making the bone deposition resemble more ordinary refuse. The Greek sacrifice and the Roman *suovetaurilia* are good examples where the species commonly used as sacrificial animals were the usual livestock, i.e. cattle, sheep and pigs.<sup>9</sup>

Another problem with studies of bones from ritual depositions is that they often only tend to verify written sources or ethnographic analogies and follow preconceived conceptions of rituals in a specific area and period within the archaeological community. The bones often serve as a kind of confirmation of what we already know or maybe assume we know, rather than contribute new knowledge.

## Animal sacrifice and the horse in Iron Age Scandinavia

An example of this problem is the assumption of the prominent role the horse is described to have had in rituals in Iron Age Scandinavia. Finds of horse bones from Iron Age Sweden are often interpreted as ritual deposition, while finds of livestock, such as cattle, sheep and pigs commonly are associated with the profane.<sup>10</sup> The fact that horses had mythological significance and played a role in rituals is known from the written sources.<sup>11</sup> There are also several archaeological finds of ritual depositions of horse bones.<sup>12</sup> It is obvious that the horse played an important role in the belief and ritual practices during the Iron Age in Scandinavia, but the focus on horse is in many cases disproportional.

There are several questionable examples of interpretations of single bones or teeth of horse from house structures or other archaeological features that have been interpreted as ritual deposition.<sup>13</sup> The presence of horse or a high frequency of the species is not enough to interpret a bone deposition as remains of a ritual. I would argue that the common farm animals—cattle, sheep and pig—were as important animals in ritual practice as horse.

Another example of the emphasis on horse is the famous find from Skedemosse with its depositions of horse bones, which have parallels with other bogs in southern Sweden and Denmark.<sup>14</sup> The abundance of horse bones is striking and most interesting. The find is often used as an example of the importance of horse in ritual practice during the Iron Age in South Scandinavia. However, what is often not mentioned is that bones from cattle are almost as frequently found and indicate that livestock also played an important part in the rituals at the site. Iron Age depositions of horse bones in bogs from Denmark are well known and often used as examples of ritual practice, but also depositions of cattle occur frequently in sacrificial bogs.<sup>15</sup>

## The taphonomic approach

The aim of this paper is not to present new definitions of how to identify ritual bone depositions. The interpretations

<sup>5</sup> Hayden 2003, 460–461.

<sup>6</sup> Ekroth 2007, 272.

<sup>7</sup> Wait 1985; Wilson 1992; Hill 1995.

<sup>8</sup> Wait 1985, 151; Wilson 1992.

<sup>9</sup> Reese 2005; Wilkens 2004.

<sup>10</sup> Andersson 1998, 250–251.

<sup>11</sup> Loumand 2006; Näsström 2002.

<sup>12</sup> Klindt-Jensen 1957; Ferdinand & Ferdinand 1961; Sten & Vretemark 1988; Jennbert 2003; Carlie 2004; see also Vretemark in this volume.

<sup>13</sup> Carlie 2004; Andersson 1998.

<sup>14</sup> Boessneck *et al.* 1968. For a more detailed description of the Skedemosse, see Vretemark in this volume.

<sup>15</sup> Ferdinand & Ferdinand 1961; Hatting 1993.

of bone depositions are rather dependent on the features of specific cases and their archaeological and cultural context. Instead, here a useful approach based on analysis and reconstructing of the taphonomic history of the bones is suggested for studies of ritual bone depositions.<sup>16</sup> There are several advantages with the taphonomic approach when dealing with ritual bone depositions. Taphonomic factors affect and alter all bone assemblages and must be considered in any osteological study of bones from archaeological sites. In all good zooarchaeological studies, taphonomy is considered and dealt with, but not always in a consistent and systematic way. When dealing with ritual bone depositions it is important to try to study and reconstruct the taphonomic history and the whole chain of events from the selection of sacrificial animals from the life assemblage to the slaughter, from the treatment of the carcass to the deposition of the bones. Of course it is not possible to grasp all aspects of the complexity of the taphonomic history of a bone deposition, but it is important to try to study different stages in the chain of events. Also, it is only possible to study those taphonomic factors that leave some trace on the bones or the composition of the bone assemblage, and this will vary from case to case depending on factors such as preservation and archaeological documentation from the excavations.

The study of the taphonomic histories and reconstruction of the “life history” of faunal remains have similarities with the biographical approach to archaeological objects and events, which also can be applied to ritual animal depositions.<sup>17</sup>

An important aspect of this approach is that it serves to reconstruct the chronology of the ritual. A ritual can be seen as a process or a chain of different acts. According to Charlotte Fabech complex ceremonies, such as animal sacrifices, resemble a drama with different acts.<sup>18</sup> A bone deposition and its taphonomic history can be divided into different stages which can be studied and linked to stages in the process of rituals. This approach helps us to reconstruct behaviour and to understand rituals and hopefully also their meanings and purposes, the belief of humans in the past.

The taphonomic history and process of a ritual deposition can be divided into five stages:

*Selection of animals.* The taphonomic history starts with the *thanatocoenose* and how the death assemblage, the killed animals, differs from or reflects the life assemblage or the living animals.<sup>19</sup> In the case of animal sacrifice this first stage is

equal to the selection of which animals are to be killed and how it relates to available animals. To study this, one has to consider what actually is known about the fauna and animal husbandry in a certain area and period. What does the selection of animals mean? Do the killed animals simply reflect the available animals or are certain animals which may have a particular symbolic meaning specifically selected?

In many studies of Greek animal sacrifice it is common to notice comparisons with different sanctuaries, which of course is of interest.<sup>20</sup> However, comparisons with ordinary settlement refuse and how it relates to the animal husbandry and subsistence typical to the period and region is rarely seen. In the analysis of what kinds of animals were selected to be used in a ritual it is important not to focus only on the species; as important could be the age and sex of the animals along with other aspects such as their condition, which can be reflected in pathology and size.

*The killing.* The stage after the selection of animals that could be studied from the zooarchaeological remains is the killing. There are many significant stages in the ritual that may have occurred between the selection of animals and the killing, such as whether the chosen animals were treated in a special way and whether they were dedicated to the gods by being fed with special food and the adorning of the animals. These events rarely leave any trace on the bones and are impossible to study in the faunal remains.

The killing is difficult to study and rarely leaves any traces on the bones, but is important to consider since it could be a significant stage in the ritual. Animals could have been killed by slitting the carotid artery or by strangulation, methods which do not leave any traces on the bones. Killing by a blow to the head results in marks on the skull bones, but it is often difficult to determine whether the fragmentation of skulls is due to killing, butchering of the head, or other taphonomic factors.

In many cases it may be impossible to determine how the killing was undertaken, but it could be possible to study where and when the animals were sacrificed. Prerequisites for killing could be of interest, such as spatial conditions and where on a site animals could have been killed. If wild animals occur in depositions it is in most cases most likely that the animals were killed somewhere else during the hunt and were transported to be deposited at the site.

Many rituals are linked to different periods of the year and by using age assessment of the remains of juvenile animals it is sometimes possible to get indicators of the season of killing. Seasonality analysis is often problematic and is dependent on detailed age assessment and assumption of the past breed-

<sup>16</sup> Magnell 2011.

<sup>17</sup> Morris 2011.

<sup>18</sup> Fabech 2009.

<sup>19</sup> Lyman 1994.

<sup>20</sup> Gebhard & Reese 2005; Ekroth 2007.

ing of animals, which is especially difficult with domestic animals. The use of seasonal indicators is dependent on environmental conditions and adaptations in the breeding of animals. The reproduction of domestic animals in the Mediterranean is expected to be less seasonal than that in Scandinavia with periods with limited food supply (i.e. winter), making seasonal analysis more problematic. However, the seasonality is important to consider since it may help to understand significant aspects of rituals.

*Processing and utilization of the carcass.* The stage that follows the killing is how the carcasses were treated. Whether whole animals were deposited or carcasses were processed and utilized is often possible to study in relative detail through analysis of butchering marks, body part frequencies and burning. If specific body parts are missing and this is not possible to explain by other taphonomic factors, it is possible to draw conclusions about the use and even in some cases the symbolism of these anatomical elements in the ritual. An example of this are finds of consumption refuse from Greek sanctuaries with animal remains without femora, sacrum or caudal vertebrae indicating that these parts were burned at the altars.<sup>21</sup> Analysis of butchering marks and fragmentation patterns can reveal if all body parts were utilized and consumed. Butchering pattern, marrow fracturing and other features such as pits with fire-cracked stones or cooking vessels can give information about cooking. Evidence of burning could give clues about cooking or use of fire in the ritual, depending on the degree of exposure to fire.

*Deposition.* The last stage in the sacrifice of animals or other use of bones in rituals is the deposition. Body part representation can be used to trace if any specific body parts were preferred in the deposition or if whole carcasses were deposited.

It is also of course important to consider in which archaeological context the bones were deposited, such as where on a site the bones were found and how the find relates to structures and landscape. How the bones are found and possible arrangement of bones could also be of great interest. Further, it could be of importance to establish if the bones were buried and so protected, placed on display, or just thrown away.

Gnawing marks, trampling and weathering can indicate in which environment the bones were placed and how they were treated before the deposition. Gnawing by scavengers and weathering are examples of taphonomic factors which can to some degree alter the composition of a bone assemblage. It is well known that osteological remains ravaged by scavengers have lower frequencies of bones from juveniles, animals with

delicate bones, such as birds, and body parts with low density like vertebrae.<sup>22</sup>

*Post-depositional factors.* The taphonomic loss caused by diagenetic factors, bioturbation and excavation methods on bone depositions is also important to evaluate. These taphonomic factors can obviously not be considered a part of the ritual process, but it is as important to study since they may drastically change the composition of the bone assemblages and thereby affect the interpretations.

## The taphonomy of a ritual bone deposition from Viking Age Frösö, Sweden

During excavations in the choir of Frösö church in 1984, the remains of a partly decomposed birch tree stump surrounded by a dark layer with bones and fire-cracked stones were found. The composition of the bone assemblage and the archaeological context with the birch tree remains indicate that it most likely represent the remains of the *blót*, the Old Norse ritual of animal sacrifices and ceremonial feasting.<sup>23</sup>

The find is one of the most striking evidences of place continuity between pre-Christian and Christian cult in Scandinavia, with the choir, the most sacred part of a church, built on top of an Old Norse cult place.<sup>24</sup> Trees were important in the Old Norse cult practice and there are several examples in the written sources of rituals associated with trees.<sup>25</sup> The most famous is the description of the *blót* (sacrifices) in Gamla (Old) Uppsala written by Adam of Bremen in *Gesta Hammaburgensis* from the end of the 11th century: “The sacrifice is of this nature: of every living thing that is male, they offer nine heads with the blood of which it is customary to placate gods of this sort. The bodies they hang in a sacred grove that adjoins the temple. Now this grove is so sacred in the eyes of the heathen that each and every tree in it is believed to be divine because of the death or putrefactions of the victims. Even dogs and horses hang there with men.”<sup>26</sup> The world-tree, Yggdrasil, played a central role in the Old Norse cosmology and was believed to be standing in the centre of the cosmos connecting the different worlds.<sup>27</sup>

<sup>22</sup> Lyman 1994; Munson 2000.

<sup>23</sup> Iregren 1989.

<sup>24</sup> Bergner 1987; Andrén 2002.

<sup>25</sup> Näsström 2002, 114–116.

<sup>26</sup> Adam av Bremen 4.27.

<sup>27</sup> Holmberg 1922; Andrén 2004, 390–391; Näsström 2006, 27–29.

<sup>21</sup> Ekroth 2009, 139–140.

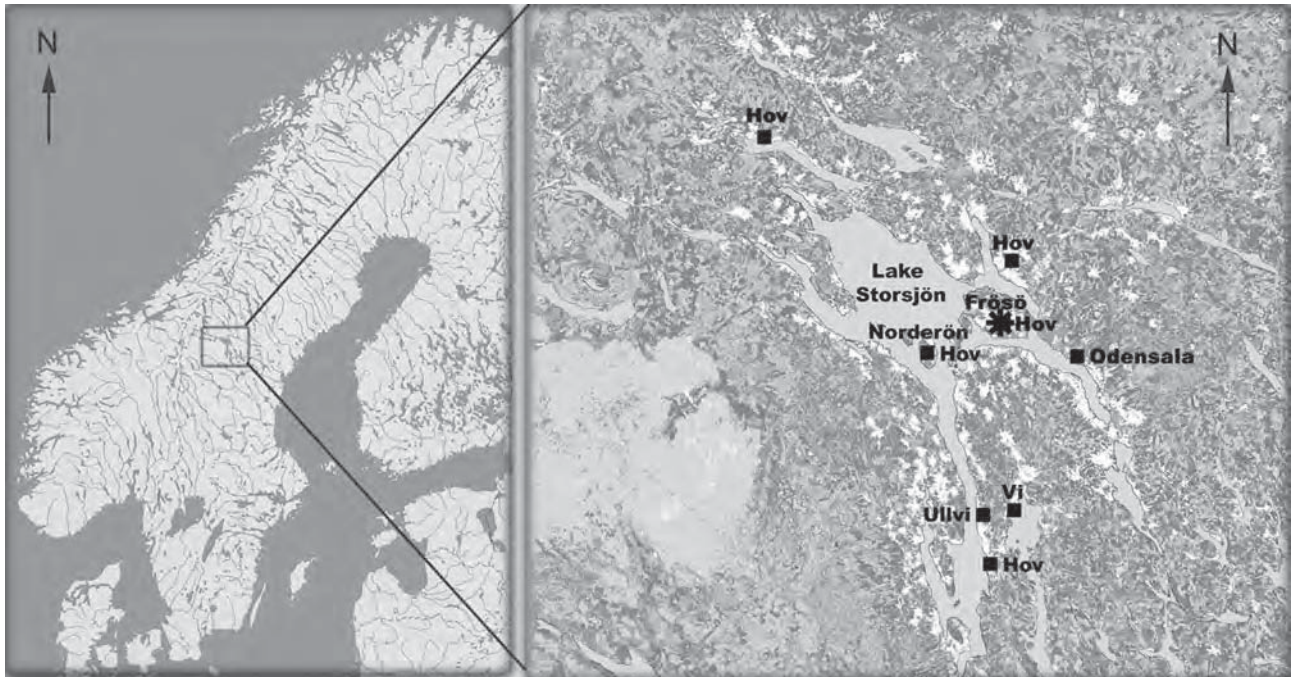


Fig. 1. Frösö church (\*) and other place names in the area around Frösö and Lake Storsjön, which relate to Old Norse cult and religion.

Frösö is an island situated in the Lake Storsjön in the county of Jämtland in the middle of Sweden (Fig. 1). The island was probably the religious, social and political centre in the region during the Viking Age (AD 800–1050).<sup>28</sup> In the area around Frösö, several place names are associated with the gods Odin, Ull and Njord or pre-Christian cult sites and this has been proposed to reflect a sacred landscape (Fig. 1).<sup>29</sup> Frösö actually means “the island of Freyr”; Freyr was the most important god in the Old Norse mythology beside Odin and Thor. The place where the church stands is called Hov, which was the Old Norse name of a site with a building with a sacred function, where sacrifices and ceremonial feasts were held.<sup>30</sup>

Radiocarbon dating of the tree remains and bones show that the ritual depositions of bones took place in the late 10th and early 11th century AD and seem to have ended when the area around Lake Storsjön was Christianized.<sup>31</sup> The latest pre-Christian graves in the area are from AD 1020–1030 and on a rune stone from Frösö, dated to AD 1060–1090 it can be read that Jämtland was Christianized by Östman, the son of Gudfast.<sup>32</sup>

## Selection of animals

When compared with other sites in the Lake Storsjön area that date from the Late Iron Age to Early Middle Ages, it can be seen that the frequency of wild animals in the bone assemblage from Frösö church is much higher than in bone assemblages from settlements.<sup>33</sup>

The most striking feature is the high abundance of bones from brown bear, a species usually present with just a few single bones, if any, in settlements (Fig. 2).<sup>34</sup> The elk is also more frequently represented in the finds from Frösö church than in settlements on the island Frösö and probably reflects the relative importance the animal had at settlements on the mainland around Lake Storsjön.<sup>35</sup>

The occurrence of teeth from red deer is also interesting, since bones from this species are not found in settlements in the area. It seems that body parts of red deer may have been

<sup>28</sup> Welinder 2008; Hemmendorff 2010.

<sup>29</sup> Brink 1990, 292–297; Vikstrand 1993.

<sup>30</sup> Vikstrand 2001, 271; Sundqvist 2007, 159.

<sup>31</sup> The deposition is radiocarbon dated with three datings of charcoal, two datings of wood from the birch tree, six datings of animal bones and four datings of human remains, see Magnell & Iregren 2010.

<sup>32</sup> Gräslund 1992; Welinder 2003.

<sup>33</sup> The NISP (Number of Identified Specimens) of wild mammals from Frösö church is 58%, while the corresponding frequency from three sites on Frösö are 0–3% and 25% at the site at Kyrklägdan on the mainland around Lake Storsjön, see Magnell & Iregren 2010.

<sup>34</sup> Two specimens of brown bear were found at the settlement at Kyrklägdan. Otherwise there are no finds of this species at other sites in the area, see Holmberg 1985 and Magnell & Iregren 2010.

<sup>35</sup> From Frösö church 13% of the NISP is from elk, while the corresponding frequency on settlements from Frösö is 0–3% and from mainland Kyrklägdan 23%.

transported to Frösö from more remote areas.<sup>36</sup> In addition, metapodials from red squirrel, and single bones of capercaillie, pike and salmon were found. Unfortunately no sex estimation of the bones from bear and elk was possible. Ageing shows that both juveniles and adult elk and bear are present and thus indicates that no selection of a specific age group was made. The killed elk and bear probably reflect the age of hunted animals.

The common domestic farm animals during the Viking Age are present: cattle, pig, sheep, goat, horse, dog and domestic fowl, but the relationship between different species is of note. Pig is clearly the most important of the livestock species, with its bones comprising 61% of the remains of domestic animals (Fig. 2). On sites from this period by Lake Storsjön and in the middle of Sweden, cattle is usually the most frequently found species followed by sheep or goats, while pig often is the third most important animal.<sup>37</sup>

Interesting to note is that horse and dog, two species often associated with rituals in Iron Age Scandinavia, are only represented by a single bone each, which suggests that these animals were not important in the rituals on this site.

The occurrence of human remains from at least two adults, one child about 3–5 years of age and one infant can also be seen as evidence of this being a special bone deposition. At first, the human remains were considered to originate from later burials in the church, but radiocarbon dating shows that they are contemporary with the animal bones and older than the church. However, it is uncertain whether the human remains actually are part of the same deposition as the animal bones or not (see below).

The age estimation shows that all mandibles or loose mandibular teeth, except one tooth fragment, are from piglets slaughtered at 2–9 months of age.<sup>38</sup> This is different from the normal kill-off patterns of pigs from Iron Age settlements in Scandinavia where consistently most pigs are slaughtered at the age of 1.5–3 years.<sup>39</sup> For sheep, primarily bones of young animals about 6–9 months are represented, but adults do occur. The sample for sheep is small, but does not seem to differ from the typical kill-off pattern at settlements. Cattle

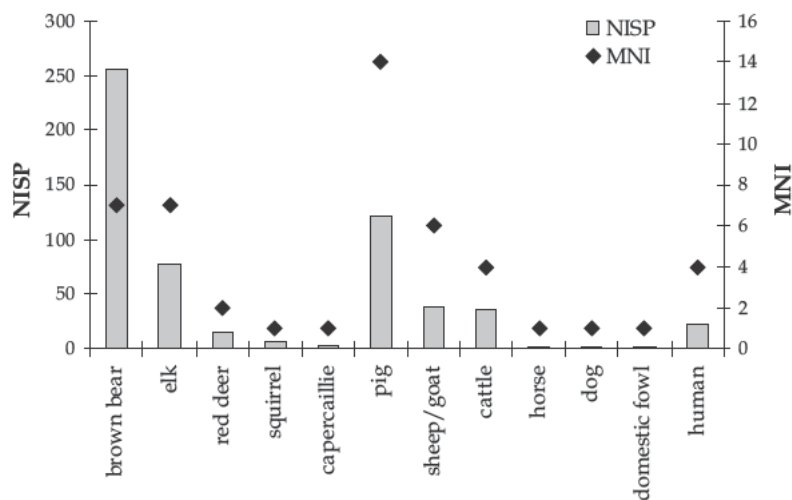


Fig. 2. Number of identified specimens (NISP) and minimum number of individuals (MNI) of mammals and birds from Frösö church. Two bones of pike and one of salmon have not been included in the figure.

is represented by most age groups, from newborn calves to subadults, from adult to very old animals. Newborn or very young goats have also been identified.

## The killing

There is no evidence to indicate how the animals were killed, but something can be said about where and when. It is likely that the domestic animals were killed somewhere near the birch tree, but elk and especially brown bear most likely were not killed on Frösö. The area of the island is too small to hold a population of bear and the animals must have been killed on hunting grounds at some distance and then been transported to Frösö.

The seasonality of the killing of animals has been studied through age estimation based on tooth development and tooth wear.<sup>40</sup> The seasonal analyses of domesticated animals, like pigs and cattle, are problematic because their reproduction and breeding are not tied to a specific period.<sup>41</sup> However, in areas with large seasonal variations in climate and food supply, such as mid-Sweden, breeding of livestock is usually

<sup>36</sup> The nearest find of red deer is from Krankmårtenhögen in Härjedalen, but also on this site bones of red deer are few, see Ambrosiani *et al.* 1984, 69.

<sup>37</sup> On other Iron Age and Early Medieval sites in the region 13–26% of the NISP of domestic animals is from pigs.

<sup>38</sup> Age estimation based on tooth development according to Carter & Magnell 2007.

<sup>39</sup> Magnell & Iregren 2010.

<sup>40</sup> Age estimation based on development and wear of teeth of pig, cattle, sheep and elk according to Brown *et al.* 1960; Jones 2006; Carter & Magnell 2007; and my forthcoming study *Age assessment of moose based on mandibular molariform tooth development*.

<sup>41</sup> Lauwerier 1983.

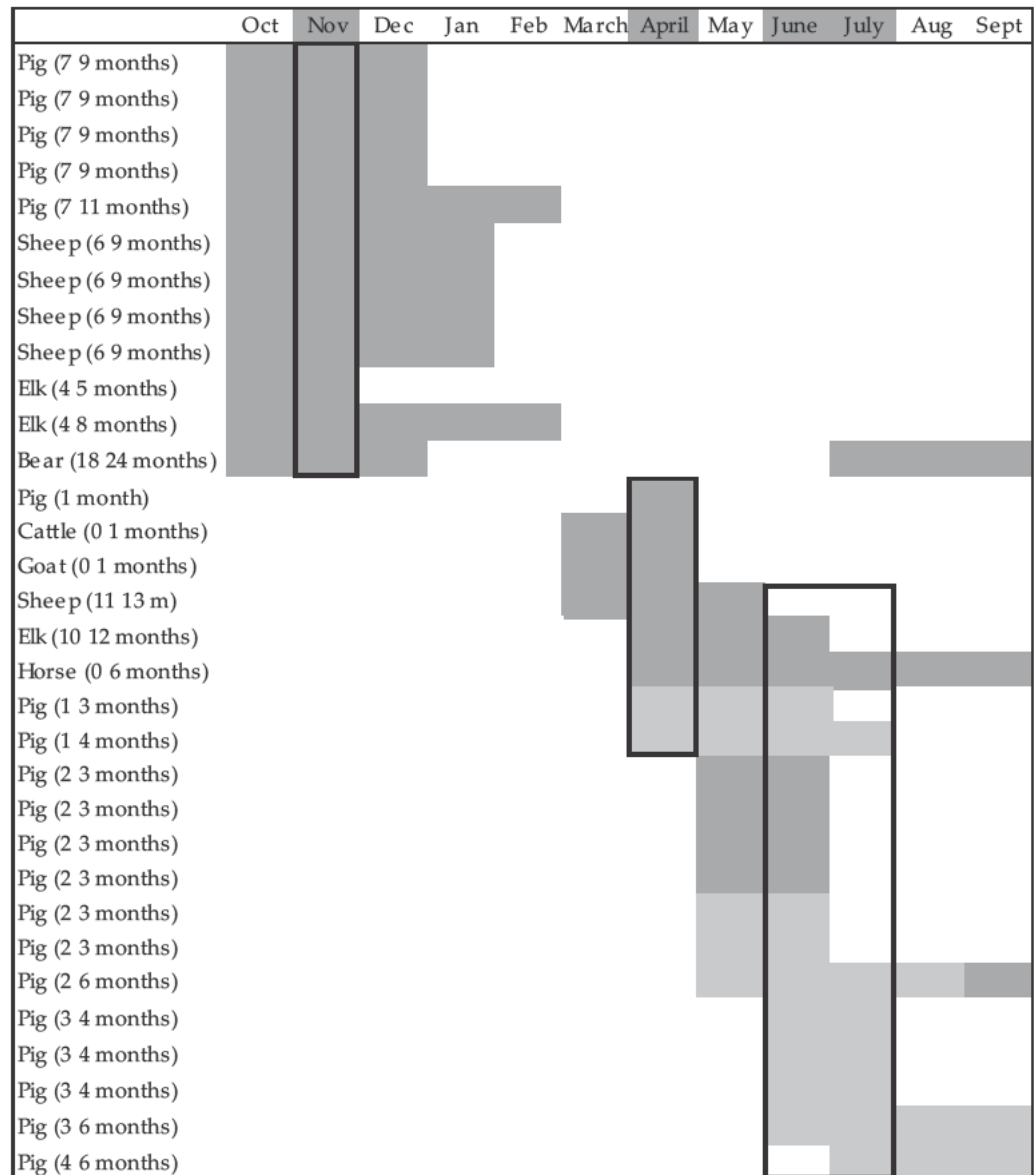


Fig. 3. Seasonality of killing of animals deposited by the birch found in Frösö church. Black rectangles indicate suggestions of the three shortest possible periods of killing. Dark grey shows certain seasonal indicators of animals with limited breeding period, while light grey shows more uncertain indicators of animals with unrestricted breeding, but with most plausible birth in spring.

concentrated to spring in order to increase the survival of the offspring.<sup>42</sup> The seasonal evidence indicates at least two, possibly three seasons of killing; in late autumn, early spring and maybe around the summer solstice (Fig. 3).

According to written sources, a *blót* was held by the end of October, which correlated with the beginning of the *winter nights*, as the winter half-year was called. This was pos-

sibly also the beginning of the new year according to the pre-Christian calendar. At the vernal equinox by the end of March, three months after the winter solstice, people gathered to make sacrifices dedicated to *diser*, a group of female fertility deities. There are few and vague historical sources, which indicate sacrifices during the summer.<sup>43</sup>

<sup>42</sup> For a more detailed discussion of seasonal reproduction of livestock in Sweden see Magnell & Iregren 2010.

<sup>43</sup> Nordberg 2006.

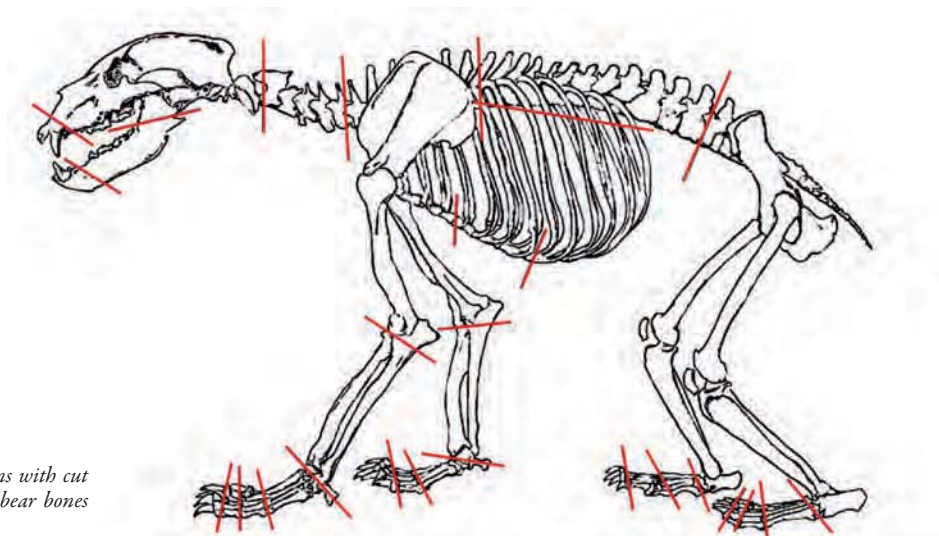


Fig. 4. Bear skeleton showing body regions with cut and chop marks from dismembering on bear bones from Frösö church.

## Processing and utilization of the carcasses

Cut and chop marks indicate that the carcasses were thoroughly utilized (Fig. 4).<sup>44</sup> Marks on bear bones show that the animals were skinned, dismembered at most joints and that the meat was cut from the bones. Missing distal phalanges and skinning marks show that the furs of the bear were removed. Chopping marks by the alveoli of the canines also show that the canines were extracted and removed, probably to be used as amulets or ritual objects. Cut marks, blackening and cracks on teeth indicate that elk, pig and sheep mandibles with tongues were cut from the head and cooked over fire. It is clear that people feasted on the meat of the animals and only bones, mainly mandibles, were left for the gods.

## Deposition

The bone modifications clearly show that no whole carcasses were hung in the trees as mentioned in written sources and which also has been suggested to have happened at the cult site on Frösö.<sup>45</sup> Instead, mainly single bones and mandibles from domestic animals and elk were deposited by the tree (Fig. 5). The body part frequency indicates a different treatment of brown bear with bones from most parts of the body, but mainly mandibles and bones from the paws (lower extremities) (Fig. 5).

<sup>44</sup> All butchering marks have been studied using a stereo-microscope in order to verify their authenticity.

<sup>45</sup> Näsström 2002.

Weathering indicates that the bones probably were exposed for a while, possibly lying on the ground around the tree before the bones became covered by soil formed from decaying leaves and refuse.<sup>46</sup>

Difference in colour and texture together with almost no weathering on the human bones from the site indicates that the human remains were treated differently from the animal bones. The excellent preservation of bones of an infant and a child shows that the bones or the corpses most likely were buried. It is uncertain whether the human bones represent the sacrifice of humans. Possibly, the human remains represent missed bones from burials which were exhumed and repatriated elsewhere during the construction of the church in the late 11th century. The human remains consist of phalanges, carpals and tarsals, bones that often are missed even in archaeological excavations of burials. Bones of infants and children are also often misidentified as from animals rather than humans.

## Post-depositional factors

Diagenetic factors and bioturbation have clearly affected the bone assemblage. The recovered bones probably represent a small portion of all the animals sacrificed and bones placed on the site. From the youngest individuals, as an example, only teeth were preserved and the bones have been lost. Bioturbation could be seen by the intrusion into the soil layers bearing the bones of autochthonous fauna living in the

<sup>46</sup> The bones have one side more exposed to weathering with longitudinal cracks typical of bones exposed to weathering lying on the ground.



church such as jackdaw, rodents, and frog. These bones differ in colour and texture from the animal bones dated to the Viking Age.

## Discussion

The analysis of the taphonomic history of the bones from Frösö church has made it possible to follow different stages of the rituals that took place at the site and to understand some aspects of the deposition. The selection of the animals reveals different aspects of the rituals at the site. The high occurrence of wild animals, most likely not hunted on Frösö island, indicates that the deposition does not represent private rituals at a settlement, but rather public sacrifices and a ceremonial feast involving a larger area around Lake Storsjön, probably hosted by the local elite and custodian of the cult place.

The combination of bones of brown bear and the birch tree could possibly be the outcome of rituals that were influenced by Saami religion and rituals. The rituals on Frösö have been proposed to represent a fusion of Old Norse and Saami traditions and rituals.<sup>47</sup> In Saami religion the idea of a world-tree or pillar of the world which holds the world up is found. The world-tree in Saami mythology is also a birch.<sup>48</sup> The importance of brown bear in the rituals could be explained by the standing of the species in Saami mythology and ritual practice, such as bear burials. Among the Saami the bear was sacred, but not a deity and was not worshipped. Myths describe the relationship between humans and the bear. The hunt, butchering, consumption and deposition of the bear bones were associated with a complicated set of rituals ending with the burial of the bones.<sup>49</sup> Bear burials in northern Scandinavia have a long tradition with the earliest dating to the 3rd century AD and the last from the 19th century.<sup>50</sup>

However, the killing and ritual consumption of meat of the most powerful and dangerous carnivore in the Scandinavian fauna in order to gain strength and courage can also be understood from the Viking Age warrior culture. Descriptions of drinking bear blood in order to gain the power and

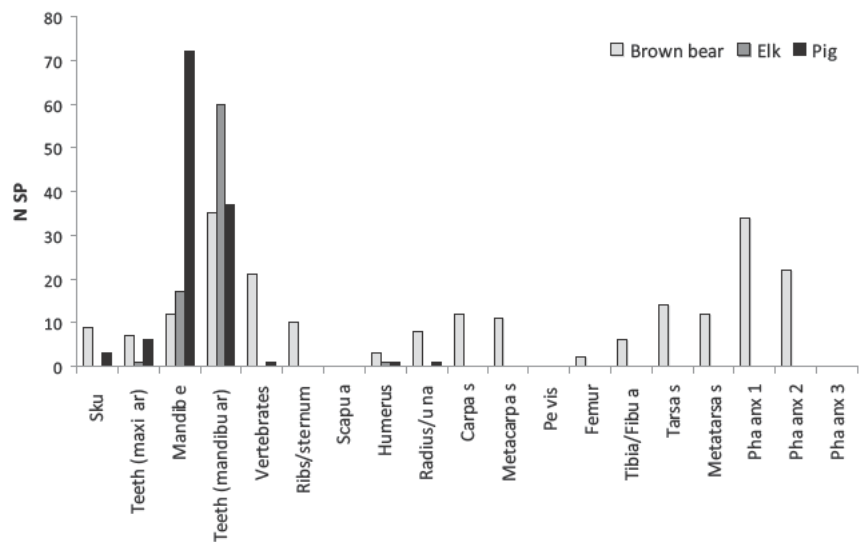


Fig. 5. Body part frequency (NISP) of the three most frequently-occurring species from Frösö church.

strength of the animal are found in Saxo Grammaticus' historic chronicle *Gesta Danorum* from the 12th century AD.<sup>51</sup>

The finds of teeth of deer and metapodials of squirrel can be associated with the Old Norse mythology and the descriptions in *Eddan* of the world-tree Yggdrasil where the squirrel Ratatosk is running up and down the tree and the deer Dain, Dvalin, Duneyr and Durteo are grazing on its twigs.<sup>52</sup> It is possible that the remains of the squirrel and deer were used in a ritual staging of the mythology in a symbolic transformation of the birch tree into the world-tree.<sup>53</sup>

Of the domestic animals, pigs and especially piglets were specifically selected to be sacrificed. According to written sources, sacrifices of pigs were dedicated to the fertility god Freyr,<sup>54</sup> which is further confirmed by the name of the island, Frösö or the Island of Freyr.

The few horse bones show that the species was not important in the rituals at Frösö. This is in contrast to the prominent standing that the horse has in the written sources about the Old Norse sacrifice.

Seasonal analysis shows that the killing and rituals took place in two or possibly three periods; late autumn, early spring and in summer. Sacrifices in late autumn took place in the beginning of the *winter days*, which also is the Old Norse ceremonial feast that is mostly known from the written sources. Rituals were most likely performed in gratitude for a good year and for a following prosperous year in animal

<sup>47</sup> Näsström 1996, 77; Welinder 2008.

<sup>48</sup> Hultkranz 1996; Mebius 2003.

<sup>49</sup> Fjellström 1981; Zachrisson & Iregren 1972; Edbom 2000.

<sup>50</sup> Myrstad 1996, 46.

<sup>51</sup> Saxo Grammaticus 2.6.11.

<sup>52</sup> *Eddan*, *Grimnismál*, verse 32–33.

<sup>53</sup> Iregren 1989, 130.

<sup>54</sup> Näsström 2002.

breeding and hunting. The killing of animals in early spring can be associated with the description in the written sources of sacrifices at the vernal equinox by the end of March dedicated to *diser*, fertility deities, in order to ensure a good year's crop and reproduction of the livestock. Sacrifice in summer was possibly made to ensure a good harvest. Interesting to note is that there seems to be no clear evidence for the sacrifices at midwinter that are known from written sources.

The deposited elk mandibles are from animals killed in late autumn and late spring. Nothing is known about any hunting regulations from the Viking Age, but in the earliest laws from Sweden from the Middle Ages, such as *Dalalagen* (AD 1250–1320), the hunting season begins in the end of autumn and ends in the end of spring.<sup>55</sup> Possibly, the mandibles represent depositions of bones from the first and last animals killed in the hunting season that were dedicated to the gods.

Traces of butchery and cooking show intense utilization of the carcasses and indicate that feasting on meat from the animals was important. Cut and chop marks show that the carcasses were dismembered at most joints and nothing indicates that whole carcasses were hung in the tree as is described in written sources of the sacrifices in Uppsala.

After the slaughter and the feast the body part frequency shows that mainly mandibles were deposited on the ground by the birch tree. The tree probably symbolized the world-tree and functioned as a mediator between the humans and the gods. The different treatment of the bears of which bones from all body regions are represented could be explained by the fact that the rituals were influenced by Saami ceremonies.

By trying to reconstruct the taphonomic history, it has been possible to follow the process of rituals on Frösö from the selection of animals to the killing and further to the deposition of bones. The result of the study also shows that some aspects of the rituals at Frösö do differ from the written sources and the prevailing conception of Old Norse sacrifices, while other aspects are in accordance.

It is important to consider that large local variation and adaptation in cult practice existed during the Viking Age in Scandinavia and the rituals revealed by the taphonomic analysis of the zooarchaeological remains at Frösö church represent how the sacrifices were performed at the island of Freyr and regional aspects of the Old Norse cult practice.

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<sup>55</sup> Nordberg 2006, 39.

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