

# Horses for the dead: funerary foodways in Bronze Age Kazakhstan

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*The authors examine the role of horses as expressed in assemblages from settlement sites and cemeteries between the Eneolithic and the Bronze Age in Kazakhstan. In this land, known for its rich association with horses, the skeletal evidence appears to indicate a fading of ritual interest. But that's not the whole story, and once again micro-archaeology reveals the true balance. The horses are present at the funeral, but now as meat for the pot, detected in bone fragments and lipids in the pot walls.*

**Keywords:** Kazakhstan, Eneolithic, Bronze Age, Andronovo, horse, burial rites, faunal remains, lipids

## Introduction

From the Palaeolithic onwards, the archaeology and cultures of Kazakhstan were heavily influenced by people's changing relationships with one particular animal species, the horse. Horses shift from being a quarry, to become a herded economic mainstay, a source of military power and, up to the present, a symbol of Kazakh culture and prestige. It is therefore unsurprising to find that horses feature heavily in the rituals, culture, art and cuisine of the region. This paper examines the role of horses in ritual from their domestication in the Eneolithic to the end of the Bronze Age, a time period which saw major economic and

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Received: 16 March 2010; Accepted: 18 May 2010; Revised: 2 June 2010

ANTIQUITY 85 (2011): 116–128

<http://antiquity.ac.uk/ant/085/ant0850116.htm>



Figure 1. Map of Kazakhstan and bordering countries showing the location of sites discussed in the text.

social changes. We focus, in particular, on the changing role and significance of horses in Bronze Age mortuary rites, drawing on evidence from new analyses of faunal assemblages from funerary and domestic contexts, and lipid residue analyses of ceramics deposited both on settlements and in graves.

## The sequence of horse culture in Kazakhstan

Since the 1980s, when excavations commenced at the Eneolithic settlement of Botai (Zaibert *et al.* 2007) (see Figure 1 for location), there has been great interest in the role of horses at the site and within its eponymous culture. The *Botai* culture of northern Kazakhstan has an extreme focus on the exploitation of horses, with very low representation of other species (Levine 1999; Olsen 2006a & b; Anthony 2007). At the start of this culture, in the mid fourth millennium BC (Levine & Kislenco 2002; Outram *et al.* 2009), the mobile hunter-gatherers in the region, described as Neolithic because of their ceramic use, settled down in substantial and at least semi-sedentary villages (Olsen *et al.* 2006) and focused economic attention upon horses. Opinion has been strongly divided between those who have argued that this was the specialised hunting of horses (Levine 1999, 2004; Benecke & von den Driesch 2003) and those who have suggested that the Botai horses were domesticated and ridden, and probably used in the hunting of other wild horses (Anthony & Brown 2003; Olsen 2006a & b; Anthony 2007). However, recent zooarchaeological and lipid residue analyses (Outram *et al.* 2009) point strongly towards Botai horses being domestic and exploited for secondary products, through both harnessing and milking, though additional hunting need not be discounted. These new lines of evidence for horse domestication at Botai have been further strengthened by independent research on ancient DNA markers

for horse coat colour that seem to indicate the likely domestication of horses in this general region some time prior to 3000 BC (Ludwig *et al.* 2009).

Given this early economic interest in horses, which now appears to have involved a developed form of pastoralism, it is not surprising to find evidence for the ritual use of horses at Botai culture sites. Botai houses are semi-subterranean structures (Olsen *et al.* 2006; Zaibert *et al.* 2007) frequently surrounded by sizeable pits. These pits rarely appear to contain random domestic refuse; instead they are filled with placed deposits of carefully selected materials. In particular, there is a significantly high number of pits that contain horse skulls, sometimes with accompanying articulated cervical vertebrae (Olsen 2003, 2006b) and there is some evidence that horse frontal bones have been modified to form masks (Olsen 2003). Pits to the west side of houses commonly contain either whole dogs or dog skulls in association with horse skulls, necks, pelvises or foot bones (Olsen 2006b). With regard to foot bones, horse phalanges are frequently decorated with incised marks (Olsen 2003; Zaibert *et al.* 2007) and a cache of phalanges has been found within a house at the Botai culture site of Krasnyi Yar.

Botai culture human burials are very rare (Olsen 2006b) and only two burial features are known, both from Botai itself. One large pit contained the bodies of four humans (two adult males, an adult female and a 10–11-year-old child) along with the partial remains of no less than 14 horses that formed an arc around one side of this feature (Olsen 2006b). In 2005, another, largely disarticulated, inhumation was discovered (Zaibert *et al.* 2007), though without such elaborate accompaniment. In addition to these two burial contexts, there are also two disarticulated human skulls, one which was made into a bowl and the other had a clay mask applied to it before it was buried in a pit outside a house (Olsen 2006b). From this evidence, it is clear that we do not yet have a full understanding of Botai culture mortuary rites, and it is unlikely that the inhumations described are 'normative' in nature. Excavations have been restricted to settlements, and there is a lack of recognisable monuments or finds scatters that might indicate cemetery sites. What is clear is that horses were an important part of Botai culture ritual deposits, along with dogs, and that skulls, whether human or animal, held particular significance.

The Eneolithic Botai culture, and its more westerly sister culture, the *Tersek* (Kalieva & Logvin 1997), end at the start of the third millennium BC. What follows is something of an archaeological 'black hole' until the establishment of early Bronze Age cultures in the very late third millennium BC, who are reliant upon a pastoral economy dominated by cattle, sheep and goats (Anthony 2007; Frachetti 2008, 2009; Frachetti & Benecke 2009). The site of Sergeivka, dating to the mid third millennium BC, represents a possible transition from the horse dominated Eneolithic to the Bronze Age economy based upon ruminants (Anthony 2007; Frachetti 2008). Horses still dominated (87%) and the material culture was similar to Botai, but 13% of livestock were domestic ruminants and there was some local metalworking (Anthony 2007). The only other similar site is that of Balandino (Frachetti 2008). There is very little evidence indeed to represent the archaeology of a vast geographical area over a period of about 800 years. Is this because there was a much smaller population, or are the sites of this period harder to locate and date? What is certain is that by the end of the millennium there was a major new phenomenon in the form of the *Sintashta* culture.

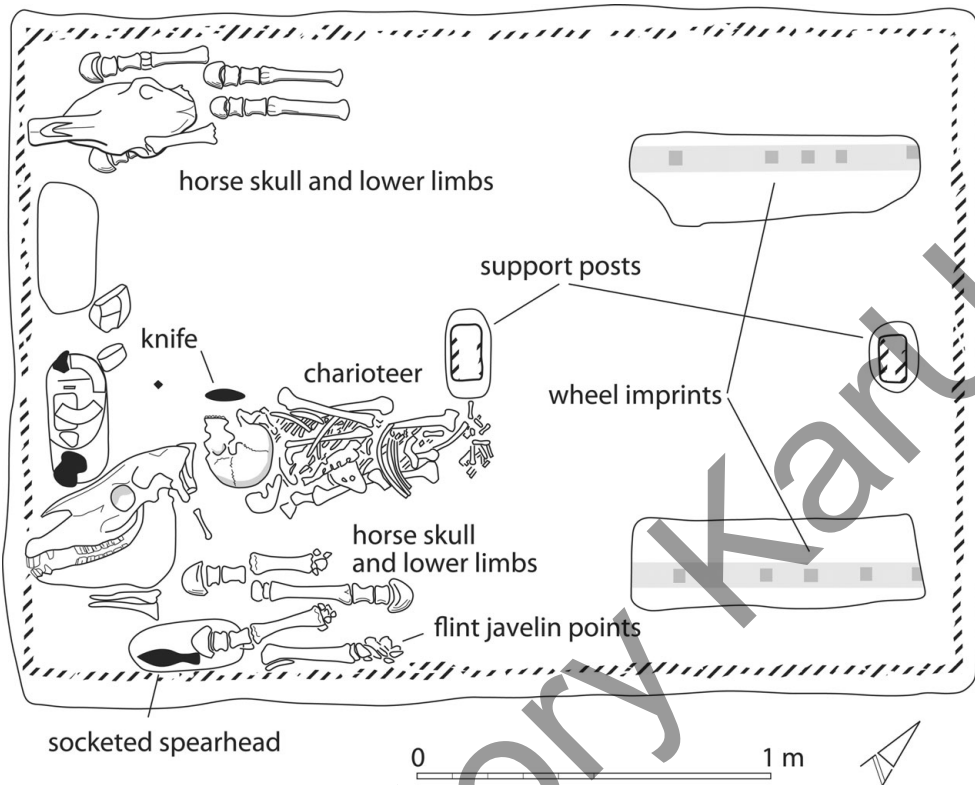


Figure 2. Sintashta Mogila Grave 30, which contains an inhumation plus two horses, represented by heads and feet, horse cheek-pieces, two ten-spoke chariot wheels and a number of weapons, including a copper socketed spearhead (after Anthony 2009: fig 4.4).

The Sintashta culture dates from about 2100–1800 BC (Anthony 2007, 2009) and is located along the rivers Ural and Tobol, and their tributaries, in the steppe territory immediately east of the Ural Mountains (Figure 1; Koryakova & Epimakhov 2007), with other key settlements being Arkaim, Alandskoye and Andreyevskoye. Settlements in this period were major sub-circular fortresses, perhaps best epitomised by the Arkaim settlement with its two concentric stone walls, subdivided into rooms by spoke-like divisions, and protected by an outer ditch (Kristiansen & Larsson 2005; Anthony 2007, 2009; Kohl 2007; Koryakova & Epimakhov 2007). At the settlements of Sintashta and Arkaim the refuse middens consisted of 60% cattle, 26% sheep/goat and only 13% horse, however, in Sintashta culture cemeteries horses represented a much more significant 39% of the assemblage (Anthony 2007, 2009). Indeed, it appears that horse sacrifice was a key component of high status burials at this time (Kristiansen & Larsson 2005; Anthony 2007, 2009). Some of the richest Sintashta graves contain the remains of chariots (Figure 2; Kristiansen & Larsson 2005; Anthony 2007, 2009; Kohl 2007; Koryakova & Epimakhov 2007) and, as such, this culture rivals the Near East for the earliest evidence of this form of vehicle (Anthony 2007, 2009; Kalekna 2009). The chariot burials are usually accompanied by a number of sacrificed

horses (as many as six), horse tack and weaponry. Such burials tend to be associated with adult males and have been widely regarded as representing the burial of high status warriors (Anthony 2007, 2009; Kohl 2007; Koryakova & Epimakhov 2007; Kelekna 2009). Whilst both males and females were buried with grave goods, there is clear evidence that males had richer graves, associated with military objects, whilst women were more commonly buried with ceramics, awls, needles and ornaments (Koryakova & Epimakhov 2007). Younger females are never associated with animal sacrifices (Kohl 2007). In the Botai/Tersek, horses absolutely dominated both economy and ritual. By the early Bronze Age, horses had been displaced by ruminants as the key to subsistence, but instead became highly valued for their role in warfare and expressions of power within an elite warrior class. Their ritual significance and association with burial and sacrifice is just as strong.

The daughter culture to Sintashta, in northern Kazakhstan, is the *Petrovka* culture, which dates to the first part of the second millennium BC (Yevdokimov & Varfolomeev 2002; Anthony 2007). Petrovka burials also contain horse sacrifices, horse tack and chariots (Koryakova & Epimakhov 2007) but there was a decline in the abundance of horse sacrifices throughout the period and chariots are confined to the earlier sites within this culture (Anthony 2007).

The next major phase of the Bronze Age in the Kazakh steppes falls under the general umbrella of the *Andronovo* cultures, including the *Alakul* and *Fyodorovo* subcultures (Yevdokimov & Varfolomeev 2002; Koryakova & Epimakhov 2007). During this period, in the mid second millennium BC, the economic focus upon domestic ruminants continues, but the horse component to ritual and burial is much less evident. The later Bronze Age sees a distinct decrease in the abundance of obvious horse sacrifices, horse tack and evidence for chariots (Koryakova & Epimakhov 2007). Instead, Andronovo graves are typified by both inhumations and cremations accompanied by ceramics with geometric designs. Animal sacrifices continue, with the animal often represented by just its head and lower limbs, however, whilst sometimes present, horses are not the most commonly represented species. The deposition of whole or partial dogs seems to have some particular significance, as does the role of fire in rituals (Koryakova & Epimakhov 2007). The final phase of the Bronze Age (c. 1300–900 BC) in Kazakhstan can be ascribed to the *Sargary* and *Begazy-Dandybaevsky* cultures (Yevdokimov & Varfolomeev 2002; Koryakova & Epimakhov 2007; Frachetti 2008). Cemeteries of this period usually involve inhumations with relatively modest grave goods comprising ceramics and occasional ornaments (Yevdokimov & Varfolomeev 2002; Koryakova & Epimakhov 2007).

It appears, on the face of it that, in the late Bronze Age, the role of horses in rituals and funerary rites had diminished considerably. There are few horse sacrifices and material culture associated with horsemanship is no longer common. Below we present the results of faunal and lipid residue analyses of later Bronze Age settlement and cemetery sites that question this general conclusion, based upon less immediately visible lines of evidence.

## **The micro-evidence: materials and methods**

In addition to studying instances of complete animal burials, that might represent sacrifices, it is worth examining the nature of the deposition of disarticulated and fragmented

animal remains at cemetery sites as well. In particular a quantitative comparison of species representation between cemeteries and settlements might indicate the relative importance of species within domestic and mortuary settings. Such a comparison is not easily achieved in faunal assemblages from Kazakhstan, as, in many cases, only a biased selection of faunal assemblages has been retained from excavations, precluding quantitative comparison. Ideally one would also wish to make direct comparison between a particular settlement and an immediately local and contemporaneous cemetery. Both assemblages would need to have been non-selectively retained and well recovered. We have located a case study where this is possible.

The Andronovo cemeteries of *Lisakovsk* (Usmanova 2005; see Figure 1 for location) have just such a related settlement and the bone assemblages have been well recovered and curated. The cemeteries contain some preserved timbers that have provided dendrochronological and radiocarbon dates suggesting they were in use between 1780–1660 BC (Panyushkina *et al.* 2008). Our faunal analyses allowed us to identify to species and element 532 bone specimens from the cemeteries and 2233 specimens from the settlement. The faunal evidence from the settlement provides a baseline for animal husbandry and hunting as part of the domestic economy, whilst the bones deposited at the cemeteries might indicate preferences for either mortuary offerings or the remains of funerary feasts.

Another way of comparing foodways between domestic and mortuary contexts is to analyse absorbed lipid residues from ceramic vessels. Such a study provides us with a window upon food preparation and consumption in these contexts. The combined study of faunal remains and lipid residues produces a much more robust basis upon which to draw inferences, particularly if both entirely independent methods point to the same conclusion. In this study we were able to analyse the residues from 26 ceramic vessels from Andronovo and Final Bronze Age mortuary sites and 73 from settlements. *Lisakovsk* cemeteries and settlement are considered once again, but sherds from other settlements and cemeteries were also studied in order to generate a sufficient sample size for consideration. These include the early Andronovo cemetery of Satan, the Andronovo site of Tashik and the Final Bronze Age site of Karaturgai. The additional settlements include the Andronovo/Final Bronze Age settlement of Konesovod III and Final Bronze Age sites of Dongal and Kent (see Figure 1 for locations).

Degraded animal fat has good survival potential within archaeological ceramics when absorbed into the fabric (Evershed *et al.* 2002). The source of lipid residues can be classified on the basis of the  $\delta^{13}\text{C}$  values of the major *n*-alkanoic acids, which are palmitic ( $\text{C}_{16:0}$ ) and stearic ( $\text{C}_{18:0}$ ) acids. Porcine, equine, piscine, ruminant carcass and ruminant dairy fats can all be distinguished on this basis (see Dudd & Evershed 1998; Copley *et al.* 2003; Stear 2008; Outram *et al.* 2009 for further details of methodologies). For this study, a completely new set of reference fats were collected and analysed from the relevant species in Kazakhstan, rather than assuming that European reference data would be directly applicable (Stear 2008; Outram *et al.* 2009). It was found that there was some difference in absolute values, but relative positions of species, based upon their metabolism and routes of lipid synthesis, were maintained in this different environment.

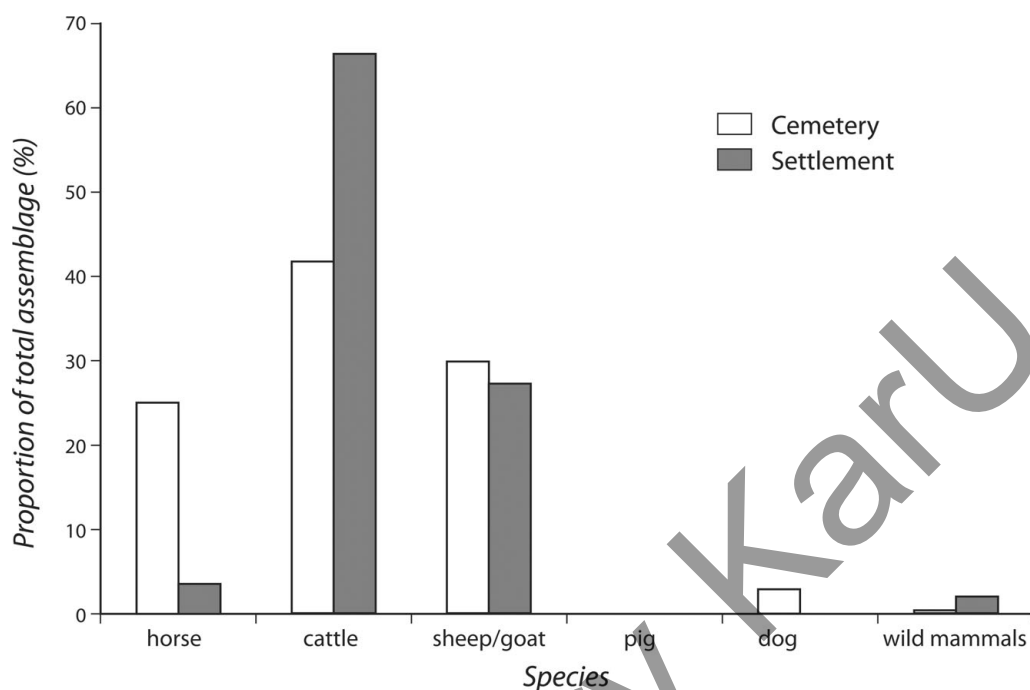


Figure 3. A bar chart showing the relative abundance of different animal species at the Andronovo cemetery and settlement sites of Lisakovsk. The bars represent the percentage of the Number of Identifiable Specimens (NISP) within each assemblage.

## Results and discussion

Figure 3 shows the relative abundances of different animal species at the cemetery and settlement sites of Lisakovsk. Cattle are the dominant species at both types of site, followed by sheep/goats, whilst pigs are absent, as is common in this region at this time. The clear difference between the settlement and the cemeteries relates to the proportion of horse remains. In the cemeteries, horses comprise about a quarter of the assemblage, whilst their numbers at the settlement are very low. The proportion of sheep/goat is fairly consistent at both cemetery and settlement sites, but horses appear to have been preferentially deposited at the cemeteries at the expense of cattle. It is also notable that the few dogs deposited at these sites are all at the cemeteries. As noted above, dog burials are associated with Andronovo and Final Bronze Age cemeteries, but burials of whole horses and equestrian material culture are not. The conclusion one might draw from examining the animal sacrifices and grave goods is that horses played a lesser role in funerary rites of the later Bronze Age periods. However, this study shows that if the disarticulated and fragmented bone assemblages are quantified, there is still a possible association between the deposition of horse remains and funerary contexts. Whilst earlier rites may have focused upon the sacrifice of whole animals in association with chariots, equestrian accoutrements and weaponry, the deposition of a greater proportion of horses in disarticulated remains from the Lisakovsk cemeteries might represent preferences in funerary feasting. If this is so then similar patterning might be present in food residues associated with funerary ceramic vessels.

Before discussing the results of absorbed lipid residue analysis, it is worth advancing several possible scenarios regarding the use and deposition of pots within graves. It is conceivable that ceramics deposited as grave goods were made purely for that funerary purpose and never for use. If this is true then lipid residues related to animal products will be absent. If lipid residues are present there remain four principal reasons for the occurrence of animal fats. Firstly, it is possible that foodstuffs were put into the pots as an offering and buried with those contents intact. Secondly, the vessels may have been made especially for a funerary feast, in which case the residues will reflect the nature of that feast. Thirdly, the pots may be domestic pots that have been used for cooking and their residues represent their prior domestic use rather than their funerary role. Lastly, they were domestic pots with a prior use, and prior residues, that were then used either for offerings or in a funerary feast. These vessels will present an integrated signal for their contents, unless the same animal products were associated with these different activities. It should be noted that re-use of pots with different products has been shown experimentally to result in an integrated signal of the different commodities, rather than the residues simply representing the last use (Evershed 2008). Integrated signals of residues from different origins are not uncommon in archaeological ceramics but it is also common to find many vessels that have been reserved for a single product through their working life. This should not surprise us as modern cooks may still reserve vessels for particular purposes to avoid tainting or spoilage, and this would have been all the more important for unglazed, coarse and porous vessels.

Figure 4 displays scatterplots  $\delta^{13}\text{C}$  values of  $\text{C}_{16:0}$  and  $\text{C}_{18:0}$  fatty acids from Andronovo and Final Bronze Age sites in central and northern Kazakhstan, with cemetery sites displayed on the left and settlements on the right. It is immediately clear that on the settlements there are relatively few pots that appear to have contained horse products, and those that might cluster around an area of potential statistical overlap between equine and ruminant signals. On the other hand, at the cemetery sites, there are a number of vessels that unambiguously contained horse products. Figure 5 expresses the proportions of pots assigned as containing residues of different species in the form of pie charts. At Lisakovsk cemeteries about a quarter of the animal bone fragments were from horse, and the pattern for lipid residues assigned as equine is very similar (23%). The percentage of vessels containing equine fats at settlements is somewhere between 3% and 7%, depending how many in the overlap area are included.

Not only are more horse bones being deposited on cemetery sites than on settlements, but there is also a tendency to deposit a much greater proportion of vessels that once contained equine products. It is clear from the residues that the vessels deposited in these graves were 'used' vessels; but were they only produced for, and used in, funerary rites? Are these vessels made purely to contain mortuary food offerings or to be used in funerary feasts? One line of evidence suggests that at least some ceramics deposited in Andronovo cemeteries are older vessels, unlikely to have been produced purely for that particular funerary purpose. It is not uncommon to find vessels in this region being repaired with the use of bronze staples. Stapled pots can be found in both domestic and funerary contexts (Bolton 2007). Figure 6 shows a multiply stapled vessel being recovered from an inhumation grave at the Andronovo cemetery site of Temirkash. This practice is not easy to understand in simple functionalist terms, as the effort required to affect a bronze staple repair would seem at odds with the relative value of the pottery vessel, and one has to doubt whether it would have been usable

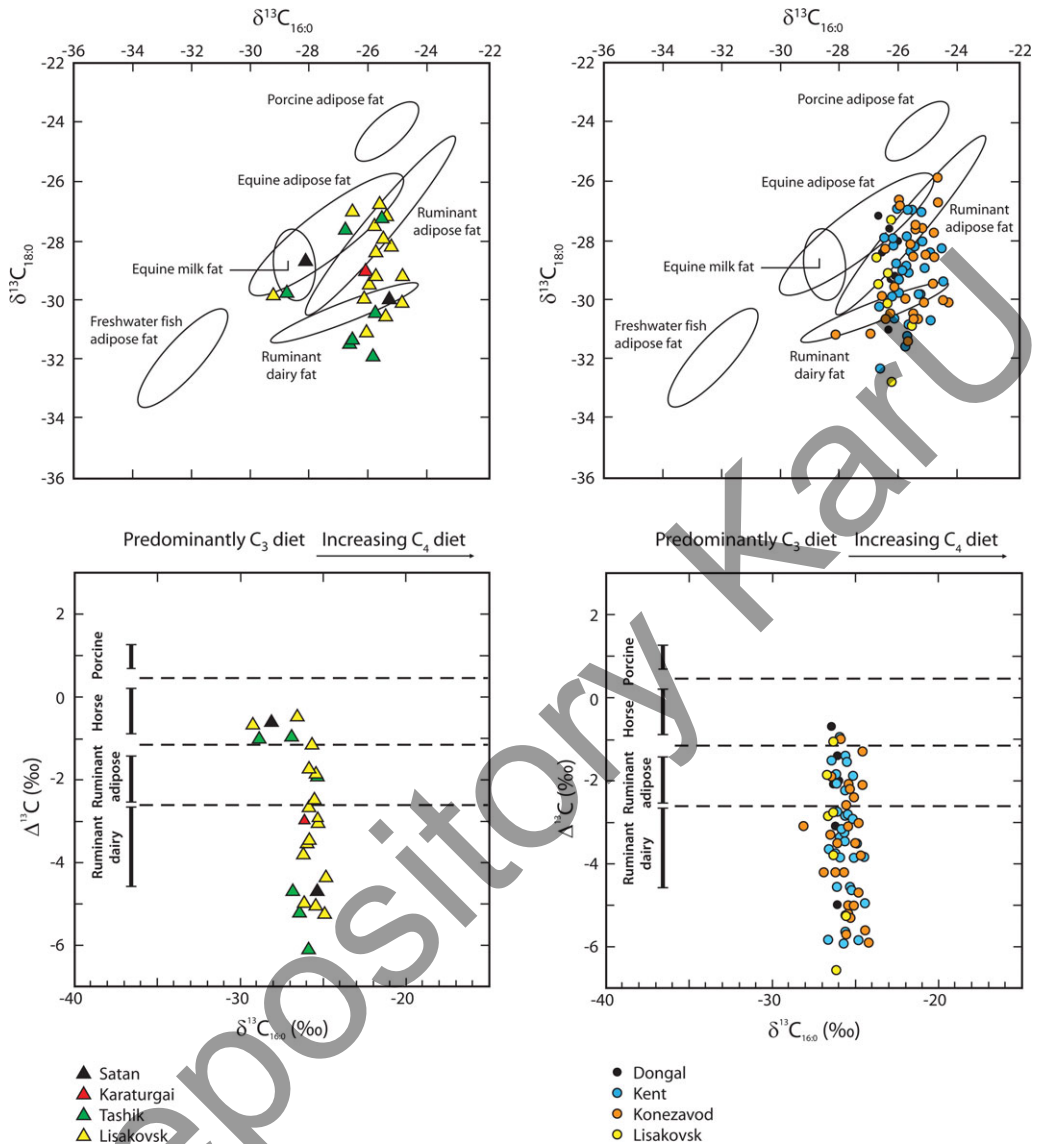


Figure 4. (Top diagrams) Plot of the  $\delta^{13}C$  values of the fatty acid methyl esters of  $C_{16:0}$  and  $C_{18:0}$ , prepared from lipid extracts from sherds obtained from cemetery sites (on left) and settlement sites (on right). The ellipses ( $p = 0.683$  confidence ellipses, SYSTAT 7.0) indicate the  $\delta^{13}C$  values of the reference animal fats from which the extracts are classified (Outram et al. 2009). Sherds plotting in between the ellipses represent the mixing of animal products in the vessel. (Bottom diagrams)  $\Delta^{13}C (= \delta^{13}C_{18:0} - \delta^{13}C_{16:0})$  values of the extracts plotted against their  $\delta^{13}C_{16:0}$  values from cemetery sites (left) and settlement sites (right). This is an additional method of classifying extracts and the further the sherds plot to the right, the higher the percentage of  $C_4$  plants utilised in the animal's diet. The reference materials are represented by their ranges and mean  $\Delta^{13}C$  values (Outram et al. 2009).

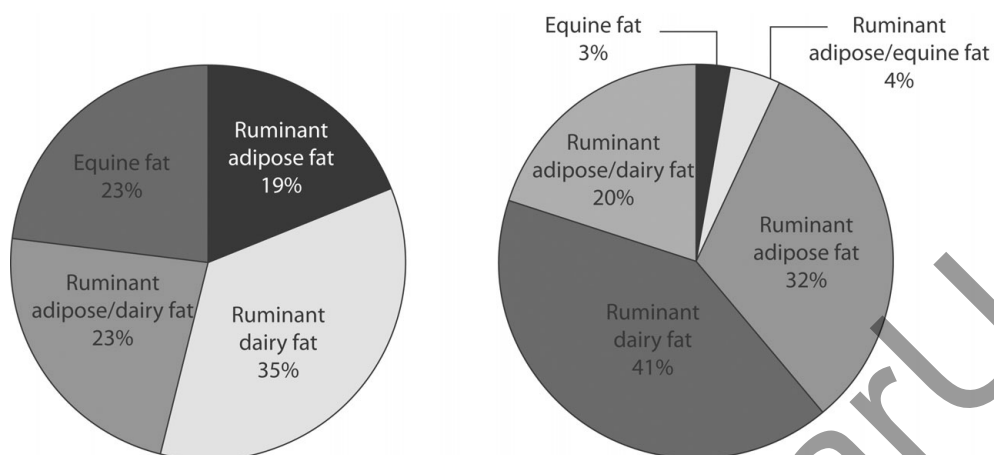


Figure 5. Pie charts illustrating the distribution of animal fats within funery vessels (on the left) and vessels from settlements (on the right), as calculated from  $\delta^{13}\text{C}$  values of  $\text{C}_{16:0}$  and  $\text{C}_{18:0}$  fatty acids.



Figure 6. A ceramic vessel being excavated from an inhumation grave from the Andronovo period cemetery of Temirkash. Note the bronze staples that were used in the past to repair the pot.

in a normal way after such a repair (Bolton 2007). The staples perhaps tell us several things, however. Such repaired vessels, found in graves, were unlikely to have been created new for mortuary deposition. It is possible to envisage old pots being repaired especially for deposition, though the practice of bronze staple repair is not restricted to funerary contexts. Perhaps certain ceramic vessels carry more than a utilitarian value and warrant repair as objects of particular significance. They could be heirlooms, valued gifts or vessels associated with particular rituals or significant events. In any case they tell us that at least some vessels deposited in graves were already older and may have had prior use. It remains unclear whether the higher proportion of vessels associated with horse products relate to funerary feasting activities, the deposition of food offerings in pots or the preferential selection of vessels previously associated with horse products. What is clear is that there is an association between horse food products and mortuary deposition.

## **Conclusion**

In the Eneolithic Botai and Tersek cultures it is clear that both economy and ritual revolve around horses. In the early Bronze Age Sintashta and early Petrovka cultures, horses are a major feature of mortuary rites amongst what appear to be burials of warriors. Horse sacrifice and chariot burial is not uncommon and graves frequently contain material culture associated with equestrianism and warfare. In this period horses are no longer the key to subsistence, but appear to be associated with military power and status. In the later Bronze Age periods, from the Andronovo onwards, horse-related material culture becomes much less common amongst grave goods and horse sacrifice and chariot burials cease. The literature on the subject makes much less reference to mortuary rites being associated with horses. Horses also make fairly modest contribution to subsistence.

This study combined the analysis of fragmented and disarticulated faunal remains and absorbed organic residues in ceramics to investigate animal use and deposition in later Bronze Age settlements and cemeteries. It is clear that both forms of evidence show a strong association between horses and funerary contexts. Reconstructing the precise activities that resulted in this association is difficult, but it is evident that horses are likely to have continued to play a significant role in the rites and ceremonies of the later Bronze Age peoples of Kazakhstan. Without negating other possibilities, the most reasonable conclusion is that horses played an enhanced role in funerary foodways and no doubt other significant events where feasting took place. Perhaps the fact that horses were a rarer component of diet, and maybe largely kept for riding, made their slaughter and consumption of greater significance, generally being reserved for special events.

Horse flesh is the subject of taboos and avoidance in many regions of the world (Simoons 1994) but where eating it is culturally accepted, and the animal remains highly significant in economic and social terms, it is still the food of feasts. One needs to look no further than modern central Asia to see this.

## **Acknowledgements**

Our thanks to all those who have helped facilitate our work in Kazakhstan, including Sergey Babich, Elena Isayev, Victor Logvin, Saule Kalieva, Valery Loman, Sandra Olsen, Bruce Bradley and Maral Khabdulina. Thanks also

to Lucie Bolton for her work on bronze staples, Sean Goddard for his illustration work, and two anonymous reviewers for their comments on an earlier draft. We are grateful to the Natural Environment Research Council (grant NE/B504506) and the British Academy (grants SG-35540 and SG-42656) for funding our work.

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