



Prehistoric animal use on the Great Hungarian Plain: A synthesis of isotope and residue analyses from the Neolithic and Copper Age

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ABSTRACT

The archaeological record of Eastern Hungary indicates that settlement patterns, subsistence strategies, ceramic style, trade patterns and mortuary customs changed from the Late Neolithic to the Copper Age (5000–2700 cal BC). Despite a rich archaeological tradition, questions remain regarding the management and use of domesticated animals and the role animal husbandry played in social change during this transition. Some researchers have hypothesized that these changes reflect a shift towards an economy that intensified its focus on primary and perhaps secondary animal products. Here we synthesize isotope data from human and animal remains and residue analysis from pottery sherds from Neolithic and Copper Age assemblages. Results indicate that the consumption and use of animal protein and fat was relatively high for both periods, with an increase in animal fats in ceramic vessels during the Middle Copper Age; however, milk products do not appear to have played an important dietary role. We conclude that livestock management remained small-scale during the Neolithic and Copper Age and that dairy use was minimal. It is proposed that the cultural changes that occurred at this time were associated with the emergence of smaller, independent farmsteads and perhaps the innovative use of secondary products like manure.

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Introduction

Understanding how populations use animals and how their use patterns change helps us to understand larger social shifts, as social organization and subsistence patterns are linked and changes in one aspect will result in changes in the other. In this article, we synthesize our results from isotope and residue analysis within the context of the rich archaeological tradition in Hungary and provide a holistic, integrated interpretation of animal use and culture change in the Neolithic and Copper Age of the Great Hungarian Plain.

To complete this synthesis, we evaluate previously published faunal data as well as new evidence from isotope and residue analysis for domesticated animal use during the Neolithic and Copper Age periods of Eastern Hungary. Specifically, we address the transition that occurred from the Late Neolithic to the Copper Age (4500 cal BC), when several aspects of material culture changed. Large, multilayer tell sites were gradually replaced by smaller, more dispersed hamlets. Three distinct ceramic styles of the Late Neolithic period (Tisza–Herpály–Csőszhalom) gave way to the more homogenous Tiszapolgár style (Parkinson, 1999). Regional

trade networks were favoured over the long-distance exchange systems of the past and the production of metals became an important part of the economy. Finally, for the first time the dead were buried in communal cemeteries, although the previous intersite burial tradition was not abandoned. Various models have been proposed to explain these changes including migration (Gimbutas, 1982), climate change (Bánffy, 1994; Horváth and Virág, 2003), scalar stress (Gyucha et al., 2009; Kalicz, 1988; Whittle, 1996), conflict (Chapman, 1999), a subsistence shift (Bökönyi, 1988a), and multifactor models that incorporate environmental degradation, technological innovation and social reorganization (Chapman, 1990; Gyucha et al., 2009; Parkinson et al., 2010; Sherratt, 1984). In this article, we examine these models in light of new data from isotopic and residue analyses.

Animal product use during the Neolithic and Copper Age on the Great Hungarian Plain

The Great Hungarian Plain, or *Nagy Alföld*, is a flat, poorly drained landscape composed of alluvial and aeolian sediments that makes up the eastern portion of the Middle Danubian Basin (Fig. 1). It is one of the largest alluvial plains in Europe, encompassing an area of approximately 100,000 km², with roughly 60% falling within the present Hungarian border (Gábris and Nádor, 2007). Reconstructed vegetation patterns for the Neolithic and Copper Age time

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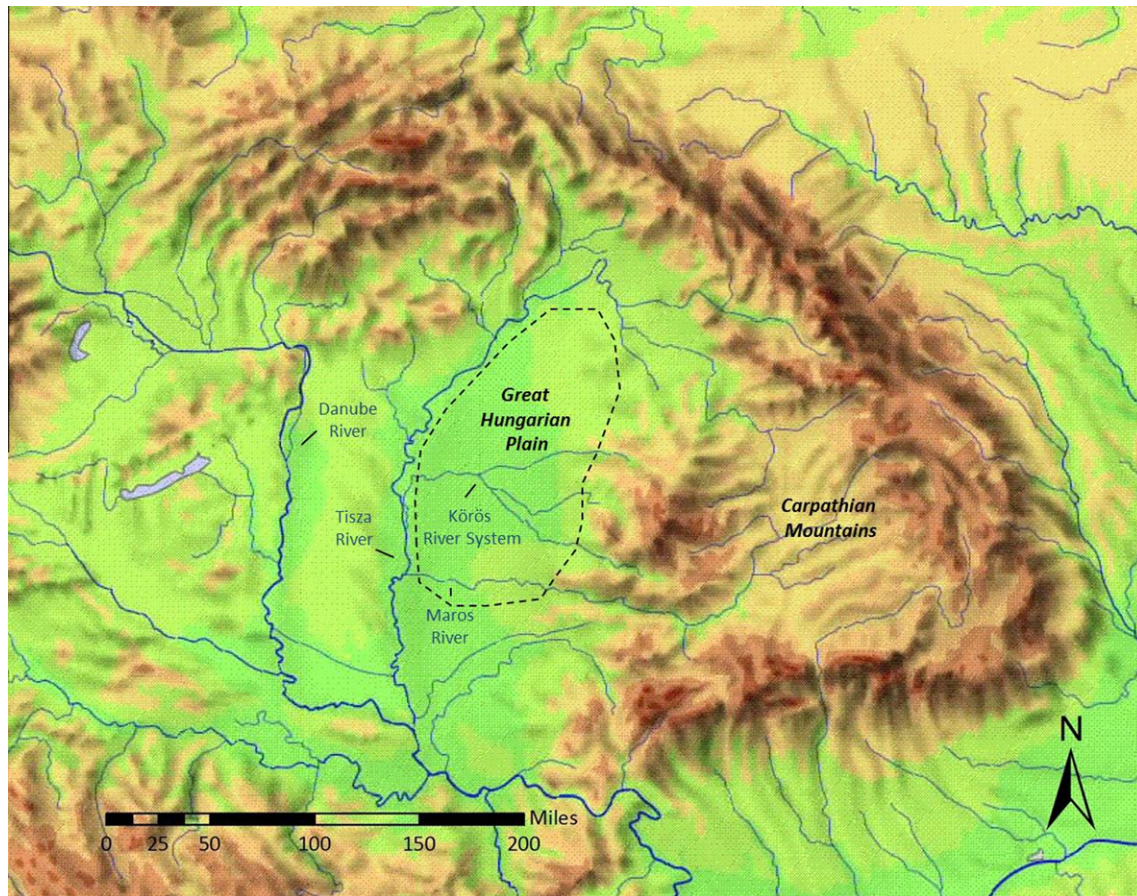


Fig. 1. Map of the Carpathian Basin. Adapted from topographic base map created by László (1996).

periods characterize the flora as steppe, forest-steppe with pockets of mixed deciduous forest, and the climate as primarily arid and continental (Gardner, 2002; Nagy-Bodor et al., 2000; Willis, 2007).

The cattle, sheep, goats and pigs used by the early farming communities of the Great Hungarian Plain were domesticated in the Near East and brought to Hungary as part of the Starčevo–Körös–Criş cultural complex (Bartosiewicz, 2005; Zvelebil, 2004). The presence and use of these livestock have been largely studied through faunal assemblages with major contributions from the work of Sándor Bökönyi and László Bartosiewicz. Throughout the 1970s, 1980s and 1990s, Bökönyi's analysis of animal remains from sites in Hungary, the Balkan Peninsula and the Near East made a significant contribution to research on the history of animal husbandry and early agricultural practices in Eastern and Central Europe (e.g., Bökönyi, 1971, 1985, 1986, 1987, 1988a,b, 1993), a tradition that has been continued by Bartosiewicz (e.g., 1999, 2003, 2005, 2006, 2007; Bartosiewicz et al., 1997).

In a recent evaluation of faunal assemblages from Neolithic and Copper Age sites from Eastern Hungary, Bartosiewicz (2005) showed that ovicaprids were the most common domesticated species during the Early Neolithic (6000–5500 cal BC), while the numbers of cattle and domesticated pigs increased during the Middle Neolithic (5500–5000 cal BC; Tables 1 and 2). During both periods, 89% of the large mammal faunal remains recovered were from domesticated species and only 11% were from wild mammals (primarily aurochs, wild boar, and deer). In the Late Neolithic (5000–4500 cal BC), wild mammal remains increased to 42%, and only 58% of all large mammal remains recovered were domesticated species. There were fewer ovicaprids than expected in the Late Neolithic faunal assemblages (Bartosiewicz, 2005, Table 1).

Table 1

Summary of faunal data from the Great Hungarian Plain, illustrating temporal patterns of animal resource exploitation (wild vs. domesticated species). Adapted from data presented in Nicodemus (2003:50–58, 94), and also Nicodemus and Kovács (forthcoming).

Time period	Culture	NISP	Wild (%)	Domestic (%)
Early Neolithic	Körös	26119 ^a	33	67
Middle Neolithic	AVK	4065	16	84
Late Neolithic	Herpaly/ Csozshalom	5731	74	26
Late Neolithic	Tisza	2115	44	56
Early Copper Age	Tiszapolgar	3106	12	88
Middle Copper Age	Bodrogkeresztur	50,592	12	88
Late Copper Age	Baden/Pecel	1969	12	88

^a NISP for 3 sites not included, since $n < 100$ and were excluded from the original table.

There are only a few faunal assemblages from Early Copper Age sites on the Plain, but while Lengyel groups to the west (in Transdanubia) continued the animal exploitation pattern observed during the Late Neolithic, at two small Tiszapolgár sites (Véztó-Bikeri and Körösladány-Bikeri), domesticated species accounted for over 96% of all the mammal faunal remains. Roughly equal numbers of cattle (31%), ovicaprid (40–41%), and pig (28–29%) remains were recovered (Nicodemus and Kovács, forthcoming). During the Middle Copper Age, while wild mammal remains are still rare, 74% or more of the domesticated faunal remains recovered are from cattle (Bökönyi, 1959; Vörös, 1987). This increase could be due to the greater value of cattle as a food source, a traction animal, or a

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