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Continuity and change in animal exploitation at the transition from Antiquity to the early medieval period in the Belgian and Dutch loess region

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ABSTRACT

This article studies the evolution of livestock exploitation during the late Roman Empire and the Merovingian period by highlighting significant and progressive changes in husbandry practices that are discernible from archaeozoological data relating to five settlements in the Belgian and Dutch loess region. The intensive exploitation of cattle for agricultural activities, transport, and meat supply of consumer sites during the Roman period was progressively abandoned. Pigs grew in importance during the late Empire and became predominant at all sites from the 5th century onwards. Reduction in demand for powerful draught animals for agricultural work in the loess belt is reflected by strong decrease in cattle size and robusticity in the 6th century. Kill-off patterns, sex-ratios, and pathologies related to the use of cattle for traction also point to changes in the objectives of breeding cattle. There was a shift from intensive exploitation for traction during the late Roman period to mixed breeding for meat and milk production in addition to traction during the Merovingian period. The archaeozoological results suggest a less intensive exploitation of agricultural land and a more significant exploitation of woodland. An increase in cattle is recorded at the end of the Merovingian period, in particular at the sites of the Meuse valley, coinciding with an increase in agricultural production.

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1. Introduction

The Roman economic system did not survive to the collapse of the Roman Empire (e.g. [Bitter, 1991](#); [McCormick, 2001](#), pp. 29–30). Both the Roman market economy and the central system for levying taxes, which had stimulated significant agricultural surplus production, disappeared. The centralised economy was on the wane from the 3rd century onwards in Gaul, although significant variation exists depending on the region under consideration ([Ferdrière, 2005](#); [Van Ossel and Ouzoulias, 2001](#)). In the study area, there is evidence for a decrease in the production capacity of the countryside from the 4th century onwards ([Bakels, 2009](#); [Van Ossel and Ouzoulias, 2001](#), p. 240). This period also saw a deterioration of climatic conditions that was not favourable to crop cultivation ([Buntgen et al., 2016](#)). Towns and small towns also suffered devolution during the late Empire due to a decline in population and an economic crisis. Towns that survived did so on a much smaller

scale, and population numbers were at their lowest during the 6th century ([Brulet, 1996](#), pp. 223–224; [Devroey, 2003](#), pp. 217–224; [Verhulst, 1999](#), p. 23; [Wightman, 1985](#), pp. 220–221). It is argued that by the 5th century, the Roman market economy had been mostly replaced by a subsistence economy (e.g. [Bakels, 2009](#); [Ferdrière et al., 2006](#)). During the second half of the 7th century, a more centralised socio-economic organisation once again emerged ([Bitter, 1991](#); [Lebecq, 2005](#)). New deforestation and agricultural growth, as well as a relative population increase, are recorded from the 8th century onwards ([Ferdrière et al., 2006](#), p. 142).

A previous study on the Belgian and Dutch loess region has shown the significant impact of the withdrawal of the Roman socio-economic system on the food economy and on husbandry practices, and that the late Roman period appears to be a turning point with regards to significant changes in the exploitation of faunal resources that fully developed during the Merovingian period ([Pigière, 2009](#)). However, the chronology of these transformations had not yet been clearly established. Moreover, the impact on animal exploitation of the centralised socio-economic organisation that re-emerged at the end of the Merovingian period had not yet been studied. New archaeozoological data allow us to approach

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these issues and to compare the evolution between different settlements located in the loess region. These aims will be achieved by analysing bones of the main domesticates (pig, cattle and sheep/goat) from five occupations continuously inhabited from Antiquity until the Middle Ages and looking at species frequencies, mortality profiles, pathologies, and biometry.

2. Regional setting

The present study focuses on an area covering central Belgium and the south-eastern part of the Netherlands (Fig. 1), which is part of the loess region. In north-western Europe, the loess region, or loess belt, extends from northern France to western Germany, via Belgium and the southern part of the Netherlands. It is characterized by thick silt deposits that have accumulated as a result of wind activity, mainly during the dry and cold climatic conditions of the Weichselian glaciation, at the end of the Upper Pleistocene (22,000–17,000 BP; Haesaerts, 1984; Haesaerts et al., 2016). This vast, gently undulating plateau provides fertile soils that are highly favourable to crop cultivation.

Below, we use chronological periods defined in Brulet (2008). We focus on the late Roman period (late 3rd–mid 5th century AD) and the first part of the early medieval period, namely, the Merovingian period (476 CE to the first half of the 8th century AD).

Climatic conditions in north-western Europe during the period under consideration can be summarized as follows. From the last century BC until the first half or the end of the 2nd century AD, climatic conditions were exceptionally stable and characterized by

warm temperatures. Then climatic conditions deteriorated, with a drop in temperatures and less stability. A period of improved climate during the 4th century AD never equalled the earlier optimum. The beginning of the 5th century AD saw another period of instability, with colder and wetter conditions. Temperatures increased slightly by the end of the 5th century, before a sharp deterioration during the Merovingian period, which was cold and unfavourable to crop cultivation. Between the second half of the 7th century and the first half of the 8th century AD, the weather once again became warmer (Buntgen et al., 2016; Magny, 2001, 2004; McCormick et al., 2012).

The vegetation history of the study area is poorly known, but general trends can be highlighted due to the growing number of pollen analyses. Deforestation started as early as the Neolithic in Northern Gaul, and by the time of the Roman conquest, the landscape was already more or less open. However, clearance of trees increased with the onset of the Roman period, in order to expand cereal production (Defgnée and Munaut, 1996). Deforestation stopped by the late Roman-beginning of the Merovingian period, and forest expansion in north-western Europe has been documented through pollen analysis (Bernard, 1998; Bourgeois, 1997; Groenman-van Waateringe, 1983; Pitte, 1983; Vanpoucke et al., 2007; Verhulst, 1995; Verhulst and Blok, 1981), a phenomenon strengthened by the humid climatic conditions at this time (Bourgeois, 1997; Verhulst and Blok, 1981). Intensive tree clearance is again documented in the study area during the Carolingian period (Groenman-van Waateringe, 1983; Kooistra, 1996). Historical sources indicate that during the late medieval period, cereal



Fig. 1. Map of the Belgian and Dutch loess region showing the locations of the settlements mentioned in the text, as well as the Roman roads and the Roman provinces and *civitates*. The brown area corresponds to the loess belt. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

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