A cross-sectional study of prevalence and risk factors for foot lesions and abnormal posture in lactating sows on commercial farms in England

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Abstract

A cross-sectional study of lactating sows in 71 commercial pig herds in England was carried out to estimate the prevalence of foot lesions and abnormal posture and investigate the associated risks. Observational data were collected on the standing posture, lesions on the hind left foot, and the pen the sow was housed in for 233 sows. The prevalence of foot lesions was 76.8% and 10.8% of lactating sows had abnormal posture. Sows housed on slatted floors during pregnancy had an associated increased risk of heel flaps but a reduced risk of toe erosion, compared with sows housed on solid concrete floors with bedding during pregnancy. There was an increased risk of abnormal posture in lactating sows housed on slatted floors during pregnancy compared with those housed on solid concrete floors with straw bedding during pregnancy. In addition, there was an increased risk of abnormal posture in lactating sows with wounds on the limbs and erosions on the toe and the heel/sole. The positive association between abnormal posture and foot lesions suggests that these lesions might be painful. Housing sows on solid floors during pregnancy might reduce the risk of abnormal posture, and certain foot lesions, in sows during lactation. However, posture is a less sensitive measure of lameness than gait, and the nature of the causal relationship between foot lesions and lameness requires further investigation.

Keywords: animal welfare, cross-sectional study, foot lesions, housing system, lameness, standing posture

Introduction

Lameness in sows (Sus scrofa) is an obvious welfare concern. Lameness is characterised by abnormal gait. Abnormal posture is highly correlated with abnormal gait (KilBride et al 2009a) and may also indicate lameness. Results from cross-sectional studies worldwide indicate that the prevalence of lameness in breeding sows is between 9 and 15% (Gjein & Larssen 1995a; Bonde et al 2004; Heinonen et al 2006) and is one of the main reasons for culling sows prematurely (Boyle et al 1998; Lucia et al 2000; Anil et al 2005; Engblom et al 2007).

Lameness arises most frequently from pathology in the limb, commonly infectious arthritis or non-infectious degeneration of the cartilage and bone in joints (Dewey et al 2003; Kirk et al 2005). Associations between specific postural changes such as 'legs turned out' and osteochondrotic and arthritic lesions have been reported (Jørgensen 2000; Kirk et al 2008). Between 5 and 20% of lameness might be attributable to foot lesions (Dewey et al 2003; Kirk et al 2005). Whether foot lesions cause lameness might depend on the location (Anil et al 2007) and severity (Gjein & Larssen 1995a) of the lesion.

The prevalence of joint disease has been reported to show no association with floor type (Jørgensen 2003; Scott et al 2006). However, slatted floors have been reported to be associated with an increased prevalence of lameness in sows (Heinonen et al 2006), perhaps due to the prevalence of painful foot lesions (Gjein & Larssen 1995b; Mouttotou et al 1999; Scott et al 2006; Gillman et al 2009; KilBride et al 2009c). Intrinsic factors, such as body condition (Anil et al 2007) or breed (Penny 1979), might also affect the risk of a sow developing foot lesions.

The prevalence of foot lesions in culled sows has been reported to be between 59 and 88% (Gjein & Larssen 1995c; Ritter et al 1999; Knauer et al 2007). Prevalence has been reported to be higher on the hind feet (Gjein & Larssen 1995c; Mouttotou et al 1997; Knauer et al 2007) and to be bilateral (Kroneman et al 1993a; Gjein & Larssen 1995a; Mouttotou et al 1997), suggesting that examining a single hind foot might provide a reasonable estimate of the prevalence of foot lesions in sows.

There were three objectives for the current study: estimating the prevalence of foot lesions and abnormal posture in lactating sows in England; investigating the associations between foot lesions and abnormal posture; and investigating the environmental risks associated with foot lesions and abnormal posture.