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A longitudinal study of risk factors for teat lesions in 67 suckler ewes in a single flock in England

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ABSTRACT

A longitudinal study of 67 suckler ewes on a commercial sheep farm near Wolverhampton, England was carried out from March to July 2010. Data on ewe teat lesions and udder and teat conformation were collected together with data on lamb health and weight at lambing and at 14-day intervals until lambs were 8–10 weeks old. Each ewe was examined on 4–5 occasions. Teat lesions were categorised as traumatic or non-traumatic based on appearance. Risk factors for the development of each type of teat lesion were investigated using mixed effect binomial regression models. The incidence of traumatic teat lesions was greatest 3–4 weeks after lambing with 27.9% new cases by udder half. There was an increased risk of traumatic teat lesions in 2 year old ewes (OR 3.5, CI 1.2, 10.5) compared with 6 year old ewes and in ewes with abnormal compared with normal teat placement, a wide or narrow udder width compared with a normal udder width, a heavy total litter weight, body condition score (BCS) < 2.5, compared with BCS of 2.5 14-days previously, and in ewes with abnormal udder skin (waxy, dry or chapped) compared with normal udder skin. The incidence of non-traumatic teat lesions was greatest 7–10 weeks after lambing with 21.4% new cases. Non-traumatic lesions were more likely to occur in ewes with BCS = 3 compared with BCS of 2.5. The risk factors for traumatic and non-traumatic teat lesions differ. Traumatic lesions are associated with teat and udder morphology, ewe age and BCS, and lamb growth rate, whereas non-traumatic lesions are associated with ewe BCS.

1. Introduction

Teat lesions in sheep can be infectious or non-infectious. Infectious agents that cause teat lesions in sheep include viruses, such as orf (Gibbs et al., 1975) and bacteria such as *Staphylococcal* spp. Estimates of the prevalence of udder abnormalities and lesions (including teat lesions) in suckler ewes range from 3.9 to 12.8% outside the United Kingdom (Madel, 1981; Sulaiman and Al-Sadi, 1992). There are no estimates for the incidence or prevalence of udder and teat abnormalities in suckler ewes in the UK.

In dairy cows, days in milk, parity, length of time on milking machines and teat end shape have been associated with the occurrence of teat lesions (Neijenhuis et al., 2000). High vacuum levels increase teat wall thickness and change the teat orifice (Hamann et al., 1993; Bhutto et al., 2010; van der Tol et al., 2010). Chapped teat skin has been associated with inappropriate care with teat dipping (such as not blotting dry) or turning animals out to pasture with wet skin (Fox and Norell, 1994; Burmeister et al., 1995). Risk factors associated with teat lesions in suckler cows include damage from fencing, damage from other cows' hooves and hard, compared with soft, floor materials (Oltenacu et al., 1990; Ruud et al., 2010).

Risk factors for the development of teat lesions in dairy ewes are likely to be similar to those in dairy cows because both are milked regularly and their offspring are weaned at a young age. However, risk factors for suckler ewes are likely to be more similar to those reported in suckler cows because suckler ewes are at pasture and nurse their lambs

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for several months. There are no publications on the causes of non-infectious teat lesions in suckler ewes but likely causes include teeth traumatising the teat when lambs suckle, damage to teat skin from wet, cold or mud/faeces and damage to the teat from housing or another ewe.

Recently it has been demonstrated that lambs suckling ewes with a traumatic teat lesion had a lower body weight 14-days after the teat lesion developed (Huntley et al., 2012) compared with lambs suckling ewes without a teat lesion, after adjusting for confounders including age, birth weight, litter size and body condition of the ewe. In addition, abnormal teat position was associated with lower lamb growth rate.

Poor udder and teat conformation have been associated with an increased risk of mastitis in suckler sheep (Lafi et al., 1998; Arsenault et al., 2008; Waage and Vatn, 2008) and pendulous udders and a large cross sectional area of teats were associated with high somatic cell count also in suckler ewes (Huntley et al., 2012). In addition, variation in teat canal length, the vacuum needed to open the teat canal in dairy cows (Weiss et al., 2004) and udder circumference and width in dairy ewes have been associated with the quantity of milk produced (Serrano et al., 2002; Kominakis et al., 2009).

Linear scoring methods to measure udder traits in dairy sheep in France (Marie-Etancelin et al., 2005), Spain (de la Fuente et al., 1996) and Sardinia (Casu et al., 2006) have been reported. Overall, authors reported that linear scoring scales are repeatable but there is less correlation across lactations than within lactations, however, Fernández et al. (1995) reported that udder size traits had low repeatability within lactation and were affected by stage of lactation whilst cistern morphology traits had high repeatability (0.45–0.77).

From Huntley et al. (2012) it is apparent that teat lesions as well as udder and teat conformation are important factors contributing to lamb growth and ewe health. To the authors' knowledge no study of risk factors for the development of teat lesions has been reported in suckler ewes. The aim of this study was to identify factors associated with the occurrence of teat lesions in suckler ewes.

2. Materials and methods

2.1. Selection of a flock and ewes

A flock of approximately 600 lowland ewes producing finished lambs was convenience selected based on farmer co-operation, handling facilities and proximity to the University. A cohort of 67 ewes was enrolled based on age and lambing date: 38 Suffolk-cross mule ewes aged two ($n = 19$) and six ($n = 19$) years, and 29 mule ewes aged nine years. There were 103 lambs born indoors to these 67 ewes. Ewes were turned out to pasture in four groups based on age and number of lambs within two weeks of lambing.

2.2. Data collection

The body condition score (BCS) (Defra PB1875, undated) of each ewe was recorded one month before the predicted lambing date and at each examination after lambing. The first examination of ewes and lambs was made in their individual lambing pen within 4 days of lambing. At this examination, the age of the ewe, number of lambs born, each lamb's weight and sex, condition of the lambing pen and availability of water were recorded. In addition, data were collected on udder health and teat lesions including lesion appearance, depth, position on the teat (Fig. 1), presence of discharge and whether the lesion was recent (fresh or scabbed). Teat lesions were defined as (a) a bite, where tooth marks were observed, (b) a tear, where the skin was torn but no distinctive tooth marks were observed, (c) a graze, where skin was ripped and/or rough in more than one area of the teat, (d) a spot, where a raised, pustule was observed, (e) a wart, where a solid proliferative lesion not filled with pus was observed and (f) a suspected orf lesion, where there were proliferative scabs on the teats, and/or where the skin was damaged, with a large percentage (>50%) of the teat affected.

The second examination was made in a shed using the farm's handling facilities and occurred within 14 days of the first examination. Data were collected on ewe BCS, lamb

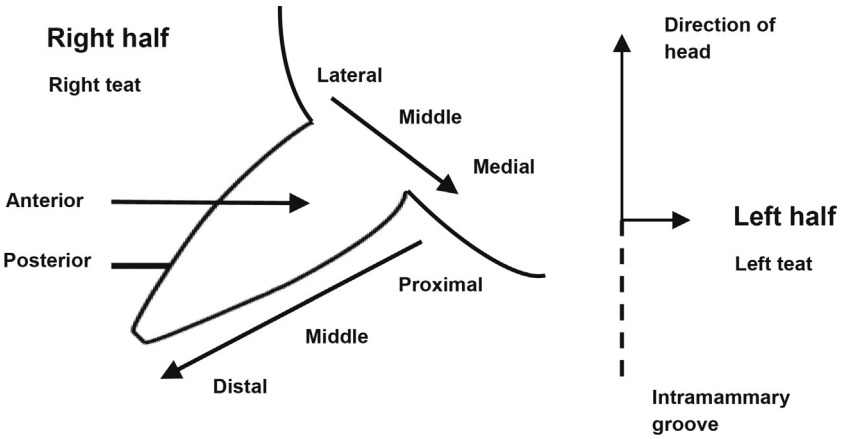

Fig. 1. Anatomical terms used to identify teat lesion placement.