Applied Animal Behaviour Science 139 (2012) 209–217

Contents lists available at SciVerse ScienceDirect

Applied Animal Behaviour Science

journal homepage: www.elsevier.com/locate/applanim

Parturition progress and behaviours in dairy cows with calving difficulty

Alice C. Barrier[a,*], Marie J. Haskell[a], Alastair I. Macrae[b], Cathy M. Dwyer[a]

[a] Animal Behaviour and Welfare, Animal and Veterinary Sciences Research Group, Scottish Agricultural College, West Mains Road, Edinburgh EH9 3JG, UK
[b] Dairy Herd Health and Productivity Service, Division of Veterinary Clinical Sciences, Royal (Dick) School of Veterinary Studies and the Roslin Institute, University of Edinburgh, Easter Bush Veterinary Centre, Roslin, Midlothian EH25 9RG, UK

ARTICLE INFO

Article history:
Accepted 14 March 2012
Available online 14 May 2012

Keywords:
Parturition behaviour
Dairy cow
Dystocia
Calving ease
Pain
Welfare

ABSTRACT

The welfare of dairy cows and their calves is compromised following a difficult calving. A better understanding of what happens during a difficult calving is needed to help prevent and alleviate adverse consequences through early diagnosis and/or pain mitigation. The objectives of this study were to investigate the calving progress and parturition behaviours (with emphasis on potential pain indicators) in cows during normal or difficult calvings, and to describe human intervention in dystocial cows.

The following video footage of calvings leading to singleton liveborn calves was used: 12 FN (farmer assisted no calf malpresentation) and 7 FM (farmer assisted with calf malpresentation), each paired to a non-assisted calving (N). Three observation periods relative to full expulsion of the calf (A: −6 h to −5:30 h; B: −4 h to −3 h; C: −2 h to birth) were observed continuously for 38 calvings.

Duration from appearance of calves' feet until birth did not differ between scores of difficulty (median time in min; N: 54.7; FN: 101.3; FM: 194.0; $P > 0.05$) but there was large individual variability. As early as period B, FN and FM cows displayed more contractions than N cows and this was also the case for FN cows in period C but not for FM cows ($P < 0.05$). FN cows were also more restless (counts of postural transitions) than N cows during periods B and C ($P < 0.05$). Overall, FM cows raised their tail for longer (in % of observation time; N: 33.7 ± 4.2; FN: 42.7 ± 5.1; FM: 54.0 ± 7.0; $P < 0.05$) compared to N cows, and FN cows tended to lie down for longer ($P < 0.10$). There was no effect of calving difficulty on self-grooming, ingestive, lying to standing transitions, exploratory (lick ground and sniffing) or "irritation" behaviours (stamping, tail switching, rubbing, turning head back). The median duration of intervention in dystocial cows varied greatly among animals (median time: 4.7 min; range: 30 s to 35 min) and thresholds were in line with current recommendations.

Dystocial cows were in later stages of labour for longer and expressed some of the behaviours differently over the course of parturition. These may relate to different pain levels when dystocia occurs and could also be used in the early detection of calving difficulty.

© 2012 Elsevier B.V. All rights reserved.

Abbreviations: N, Non-assisted calving; FN, Farmer assisted calving with no calf malpresentation; FM, Farmer assisted calving with calf malpresentation; LLHR, Lie lateral with head rested; BCS, Body Condition Score; LS, Lying to standing transition; REML, Restricted Maximum Likelihood.

* Corresponding author. Tel.: +44 0131 651 9307; fax: +44 0131 535 3121.
E-mail addresses: alice.barrier@sac.ac.uk (A.C. Barrier), marie.haskell@sac.ac.uk (M.J. Haskell), a.i.macrae@ed.ac.uk (A.I. Macrae), cathy.dwyer@sac.ac.uk (C.M. Dwyer).

0168-1591/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
doi:10.1016/j.applanim.2012.03.003

1. Introduction

Calving in dairy cows is an essential feature of the system supporting milk production and herd renewal. Parturition is nonetheless a risky time for the dairy cow and her calf. Difficulty in giving birth (also called dystocia) requires human intervention to deliver the calf. Interventions in Holstein cows occur in nearly 1 in 6 calvings in the UK (Wall et al., 2010) but this figure varies widely nationally and internationally (Mee, 2008a), with reports that it is required in up to half of the primiparous cows in the United States (Mee, 2008b). Calving difficulty is associated with economic losses and compromised animal welfare, with reports of poor health and performance in dairy cows and higher neonatal mortality and morbidity in their calves (Barrier and Haskell, 2011; Barrier et al., 2011a; Mee, 2008a).

The behaviour of the cow changes as parturition approaches (Miedema et al., 2011b; von Keyserlingk and Weary, 2007). These changes have prompted development of devices for the automated detection of the onset of parturition in farm animals (Mainau et al., 2009; Mottram, 1997; Oliviero et al., 2008). Such calving detection can be advantageous to ensure provision of adequate supervision, timely human intervention (when difficulty arises) and early care to the newborn calf. There would, however, be increased benefit in early diagnosis of cows that need assistance. There are some documented differences in the prepartum behaviours of dystocial cows compared to cows calving normally (Mainau Brunsó, 2011; Miedema et al., 2011a; Proudfoot et al., 2009; Wehrend et al., 2006), which could be used for that purpose. However, findings so far have been inconsistent and behavioural differences among cows calving normally or with difficulty merits further investigation.

Dystocia is also recognised by veterinarians as being a very painful condition in cattle (Fajt et al., 2011; Huxley and Whay, 2006; Kielland et al., 2009; Laven et al., 2009). Indeed, dystocial cows experience longer labour and straining compared to cows that are not assisted at calving (Berglund et al., 1987; Gundelach et al., 2009; Miedema et al., 2011a). Higher blood vasopressin concentrations (a hormone secreted in response to stressful/painful stimuli) have also been reported in conjunction with dystocia and parturition pain (Hydbring et al., 1999; Olsson et al., 2004); although this could also be the result of longer duration of labour. The intervention itself, although necessary, may also lead to additional pain because of the stretching in the birth canal and the further pressure applied to extract the newborn (Scott, 2005). Yet, parturition pain has received little attention (Rushen et al., 2007). In support of this, Huxley and Whay (2006) report that nearly a quarter of the veterinarians surveyed do not administer pain relief unless a caesarean section is performed, and of the vets who use analgesics, most administered them in less than half of the cases encountered.

Behavioural changes are useful tools for the investigation of pain in animals (Anil et al., 2002; Bateson, 1991; Rutherford, 2002; Vinuela-Fernández et al., 2007; Weary et al., 2006). In the context of parturition, behavioural expressions are essential clues for farmers to make their judgment on the level of distress of the cow and whether intervention should be carried out. In human obstetrics and neonatology, pain evaluations also rely on behavioural expressions through the use of visual analogue scales and numerical rating scales (Abu-Saad et al., 1998; Carbajal et al., 1997; Currie, 2008; Slater et al., 2008).

There is a growing interest in the alleviation of parturition pain in cattle associated with dystocia and whether this can be achieved through the use of non-steroidal anti-inflammatory drugs (Duffield and Newby, 2010; Mainau Brunsó, 2011; Richards et al., 2009). This is however challenging because: (1) very little is known about pain at calving as highlighted by Mainau and Manteca (2011) and (2) few studies have focussed in detail on behaviours and progress at calving. This is particularly evident among dystocial cows, and it is unknown how these behavioural changes in parturient behaviours relate to pain.

Therefore, there is a need to document the behaviours and parturition progress of dystocial cows in relation to cows that calve normally, particularly for behaviours that could relate to the expression of pain.

The first objective of the study was to characterise the progress of calving in dystocial cows as opposed to cows calving normally. The second objective was to document intervention at calving in terms of thresholds and intervention durations in dystocial animals. Finally, the third objective was to compare the behaviours of dystocial cows to eutocial cows, with a particular emphasis on behaviours that may indicate pain, as labour progresses.

2. Materials and methods

2.1. Animals, housing and calving management

The study took place at the Crichton Royal Farm (Scottish Agricultural College, Dumfries, UK) between November 2008 and February 2010 and in accordance with the UK regulations on animal care and ethics of experimental animals. Preparturient Holstein cows were housed in one of the two contiguous roofed calving sheds (36 m × 5.9 m; 36 m × 5.7 m) approximately 3 weeks before they were due to calve. Animals were from two genetic groups (S: animals selected toward greater milk solids production; C: animals selected to be UK average) as part of a long-term genetic breeding and feeding trial (Bell and Roberts, 2007; Pryce et al., 1999). Calvings took place all year round. One calving shed was provided with a low forage diet while the other was provided with a high forage diet and each shed housed on average 8 animals (26.6 and 25.7 m^2/cow, respectively). Multiparous cows were allocated to a shed dependent upon their diet allocation but heifers were allocated to either shed to balance each feeding group for numbers as they were not allocated to a diet group until they calved. Animals were bedded on straw, provided with ad libitum access to water and sheds were cleaned regularly. Fresh total mixed ration was delivered at the feeder in the afternoon once every two days.

Dependent upon occupancy and space availability, calving animals were isolated from their group-mates by a barrier placed near the entrance of the shed, opposite

Download English Version:

https://daneshyari.com/en/article/6379736

Download Persian Version:

https://daneshyari.com/article/6379736

Daneshyari.com