

Dairy Sessions

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A Retrospective Video Analysis of the Behavior of Periparturient Dairy Cattle

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Abstract

The impact of calving difficulty on the behavior of periparturient dairy cattle has not been reported. The objective of this study was to measure variables associated with difficulty of calving, and to identify the associations of parameters with periparturient behavior. Previously recorded videotapes of 23 cows on day -1, 0 and +1 relative to calving were analyzed. Data included frequency and duration of standing and lying behavior, calving difficulty score, duration of calving and calf body measurements. Calving difficulty was scored as: 0-unassisted, 1-easy pull, 2-hard pull. Video information was analyzed, interpreted and entered. Data were analyzed using logistic and linear regression with Statistix. Heifers were more likely to require assistance during calving ($P < 0.01$). Male calves weighed significantly more than female calves ($P < 0.05$). Cow standing and lying behavior differed on the day of calving. Pre-calving, heifers lie for 18 fewer minutes per lying bout compared to cows (37.1 ± 3.8 versus 55.1 ± 6.4 minutes per bout, $P < 0.02$). Mean pre-calving lying time was also influenced by calving difficulty, as cows requiring assistance spent 15 minutes less lying down per bout ($P < 0.05$). Post-calving, heifers lie for 13 minutes less per bout than cows (40.4 ± 3.1 versus 53.7 ± 8.8 , $P = 0.09$). Cows taking longer to calve lie for fewer minutes each bout ($P < 0.02$). Finally, dams that had hard pulls lie for 12.5 fewer minutes each bout ($P = 0.11$). When mean lying bouts post-calving was analyzed, controlling for pre-calving mean lying time, only calving duration remained significant. Calving duration also positively influenced the number of post-calving lying bouts ($P = 0.05$). Lying behaviour, both pre and post-calving, was the most significant measurement related to calving. Cows with longer calvings spent less time lying down after calving. Differences between lying time for cows and heifers merits further investigation. It is possible that this

difference is related to the presence of pain, and that there are opportunities for pain management at calving.

Résumé

L'impact de la difficulté au vêlage sur le comportement des vaches laitières péri-parturientes n'a pas encore fait l'objet d'études publiées. La présente étude visait à mesurer les variables reliées à la difficulté de vêlage et à identifier les paramètres du comportement péri-parturient qui y seraient associés. Nous avons analysé sur vidéocassette le comportement de 23 vaches filmées aux jours -1, 0 et +1, par rapport au jour du vêlage. Les données recueillies étaient la fréquence et la durée des épisodes durant lesquels les vaches étaient debout et allongées, une cote de difficulté de vêlage, la durée de celui-ci et les mesures corporelles du veau. La difficulté de vêlage était cotée comme suit : 0 = sans aide, 1 = avec extraction facile et 2 = avec extraction forcée. Les renseignements observés sur vidéo ont été analysés et interprétés, et le tout consigné. Pour analyser les données, on a eu recours à la régression logistique et linéaire du logiciel Statistix. Les taures ont eu davantage tendance à nécessiter de l'aide pendant le vêlage ($P < 0,01$). Les veaux mâles se sont avérés significativement plus lourds que les veaux femelles ($P < 0,05$). La tendance des vaches à rester debout ou à s'allonger a varié le jour du vêlage. Avant le vêlage, les taures se sont allongées 18 minutes de moins par épisode d'allongement que les vaches ($37,1 \pm 3,8$ versus $55,1 \pm 6,4$ minutes par épisode, $P < 0,02$). La difficulté de vêlage a également influencé la durée moyenne pendant laquelle les vaches se couchaient avant le vêlage : les vaches nécessitant de l'aide ont passé 15 minutes de moins par épisode à s'allonger ($P < 0,05$). Après le vêlage, les taures se sont couchées 13 minutes de moins par épisode que les vaches ($40,4 \pm 3,1$ versus $53,7 \pm 8,8$,

$P=0,09$). Les vaches prenant plus de temps pour vêler se sont allongées moins longtemps par épisode ($P<0,02$). Finalement, les vaches ayant nécessité une extraction forcée s'allongeaient 12,5 minutes de moins par épisode ($P=0,11$). Quand on a analysé les moyennes de durée d'allongement après le vêlage en tenant compte des durées moyennes d'allongement avant le vêlage, seule la durée de vêlage est demeurée significative. La durée du vêlage s'est aussi montrée positivement corrélée au nombre d'épisodes d'allongement après le vêlage ($P=0,05$). La tendance à s'allonger, avant et après le vêlage, s'est avérée la mesure la plus significative lors du vêlage. Les vaches ayant pris le plus de temps à vêler sont celles qui ont passé le moins de temps à s'allonger après le vêlage. La différence de durée d'allongement entre les taures et les vaches mérite une recherche plus poussée. Il est possible que cette différence soit reliée à l'intensité de la douleur et il y aurait donc place à une stratégie d'atténuation de la douleur lors du vêlage.

Introduction

Parturition is a necessary component of milk production, and it is common for cows, especially at first calving, to require assistance. This dystocia typically results in bruising or lacerations. It is logical that there may be pain for several days following parturition. Previous studies have recorded changes in cow behaviour around parturition. Pain arising from dystocia is likely a factor in these behavioural changes. However, the correlation between behaviour and calving difficulty has not been examined. The purpose of this research was to investigate the relationships between dystocia and behavioural events around calving, to identify predictors of calving difficulty and quantify opportunities for pain management at calving.

Materials and Methods

Previously recorded videotapes of Holstein cows and first-calf heifers, on day -1 , 0 and $+1$ relative to calving were analyzed. The data evaluated included the frequency and duration of standing and lying bouts,

length of calving, calving difficulty score and calf measurements. In addition, from the health records, the incidence of postpartum disease was studied. Calving difficulty was scored from 0 to 3 (0 -unassisted, 1 -easy pull, 2 -hard pull). Length and difficulty of calving was correlated with cow behaviour. The video information was entered into a Microsoft Excel table, and analyzed using logistic and linear regression with Statistix.

Results

Previously recorded videotapes of 23 animals, on day -1 , 0 and $+1$ relative to calving, were analyzed. Heifers were more likely to require assistance during calving ($P<0.01$). Male calves weighed significantly more than female calves ($P<0.05$). Cow standing and lying behavior differed on the day of calving. Pre-calving, heifers lie for 18 fewer minutes per lying bout compared to cows (37.1 ± 3.8 versus 55.1 ± 6.4 minutes per bout, $P<0.02$). Mean pre-calving lying time was also influenced by calving difficulty, as cows requiring assistance spent 15 minutes less lying down per bout ($P<0.05$). Post-calving, heifers lie for 13 minutes less per bout than cows (40.4 ± 3.1 versus 53.7 ± 8.8 , $P=0.09$). Cows taking longer to calve lie for fewer minutes each bout ($P<0.02$). Finally, dams that had hard pulls lie for 12.5 fewer minutes each bout ($P=0.11$). When mean lying bouts post-calving was analyzed, controlling for pre-calving mean lying time, only calving duration remained significant. Calving duration also positively influenced the number of post-calving lying bouts ($P=0.05$).

Conclusions

Lying behaviour, both pre and post-calving, was the most significant measurement related to calving. Cows with longer calvings spent less time lying down after calving. Differences between lying time for cows and heifers merits further investigation. It is possible that this difference is related to the presence of pain, and that there are opportunities for pain management at calving.