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Dystocia affects calf health, survival

Bottom Line

with
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IN a previous column (Kertz, 2006), the sorry state of calves born dead was addressed using data of Meyer et al. (2001) from seven midwestern states available through the MidStates Dairy Records Processing Center with the cooperation of the National Association of Animal Breeders and from a study by Ettema and Santos (2004) with three large commercial herds in California.

At the time, these were the only published sizeable datasets I could find. However, now there is another published study (Lombard et al., 2007) to shed further light on this subject area. Authors are with the U.S. Department of Agriculture's Animal & Plant Health Inspection Service and Colorado State University at Ft. Collins, Colo.

Three Colorado dairies (more than 95% Holsteins) with herd sizes between 1,000 and 5,000 head provided a total of 7,788 calves from 7,380 calvings occurring between Oct. 1, 2001, and Nov. 5, 2002, with dairy A providing more than 75% of the calves. From that base, health events from 1 to 120 days of age were monitored for 3,544 calves.

Nearly two-thirds of calves were born unassisted (dystocia score one), whereas 26% had mild dystocia score two and 11% had severe dystocia score three. While severe dystocia was similar among all dairies, dairy B had a smaller percentage of mild dystocia compared to dairy A. Dairy C had a much higher percentage of mild dystocia than either dairy A or B.

Here are a number of other key findings:

• Nearly one-half (49%) of calves born to first-calf heifers were delivered unassisted, whereas 19% were classified as severe dystocia. Older cows averaged 71% delivered unassisted, and only 7% were classified as severe dystocia.

• Twins (majority born to older cows) accounted for 11% of calves born with 57% requiring assistance during birth compared to 34% of singleton births.

• Bull calves were more likely ($P < 0.001$) to require assistance compared to heifer calves (40 versus 33%).

• Stillborn incidence of 8.2% increased ($P < 0.001$) with an increasing dystocia score. Overall stillbirth incidence was 6.3% for heifer calves compared with 10% for bull calves. First-calf heifers had a greater incidence of stillbirths for heifer and bull calves than older cows — 9.9 and 15.2% versus 4.5 and 7.5% — with overall stillbirths being 12.6% for first-calf heifers versus 6.1% for older cows.

• Odds of stillbirths increased ($P < 0.001$) with an increasing dystocia score. Overall, calves born with dystocia scores of two and three were 2.3 and 15.4 times more likely ($P < 0.001$) to be stillborn than calves born unassisted. First-calf heifers were 1.7 times more likely ($P < 0.001$) to give birth to stillborn calves than older cows.

Bull calves were 1.4 times more likely ($P < 0.001$) to be stillborn than heifer calves. Heifer calves having dystocia scores of two or three were 2.0 and 20.7 times more likely ($P < 0.001$) to be stillborn than heifer calves born with no assistance. Heifer calves born to first-calf heifers were 2.0 times more likely ($P < 0.001$) to be stillborn than heifer calves from older cows. Most interestingly, heifer calves having severe dystocia were at increased odds of stillbirth compared to bull calves.

Calves born during winter were at decreased odds ($P < 0.006$) of being stillborn compared to calves born in autumn.

• Heifer calf odds of having any morbidity event was significantly increased for dystocia scores two and three. Heifer calves born to first-calf heifers were at decreased odds of having a morbidity event compared with those calves born to older cows. Heifer calves born in winter and spring were at increased risk for morbidity compared with those born in autumn, with summer-born calves being lowest of all.

• Heifer calf odds for a respiratory event were significantly increased for dystocia scores two and three. Heifer calves born in winter and spring were 4.2 and 1.9 times more likely to experience a respiratory event compared with those born in autumn, with summer being lowest of all.

• Heifer calf odds of having a digestive event were increased for those calves born to dams that had mild or severe dystocia. No parity effect was observed, and the same seasonal pattern was observed as noted above.

Photo: U.S. Department of Agriculture.

• Heifer mortality of those alive at 24 hours but that died before 120 days of age increased only for those born to dams (no parity effect) having severe dystocia with the same seasonal pattern noted above. Heifer calves with dystocia scores of two and three were 1.3 and 6.7 times more likely ($P < 0.001$) to be born dead or die between birth and 120 days of age than those calves born unassisted. Heifer calves born to first-calf heifers had 1.2 times greater ($P < 0.001$) odds of dying than those born to older cows, with the same seasonal pattern as noted above.

• Although only 8.2% of heifer calves had severe dystocia, they accounted for 30% of all heifer mortality to 120 days of age.

Given the above picture, here are some further observations:

• Three general causes of dystocia are fetal-maternal size mismatch, fetal malpresentation and maternal-related causes. Dystocia occurrence has a major impact, with 35% of calves requiring assistance and resulting in 75.5% of the stillborn calves. Although only 10.8% of calves had severe dystocia, they accounted for 49% of all stillbirths.

• Since 25% of stillbirth calves occur after an unassisted birth, this suggests that observation frequency of calving pens and application of intervention strategies during calf delivery are inadequate.

• Because calves compromised by dystocia will be more susceptible to environmental challenges, it is reasonable to attribute the majority of such deaths to dystocia, for example, in cold or wet weather. Paradoxically, decreased occurrence of stillbirths in the winter may be the result of increased attention by herd personnel to calves or because calves adapted fairly quickly to the environment when they were not compromised by a difficult delivery.

• Pathophysiological effects of dystocia in calves are trauma and asphyxia, which can then result in postnatal metabolic and respiratory acidosis, hypoxemia, passive transfer failure of immunoglobulins from colostrum and hypothermia. Severe dystocia has been associated with lower body temperature, reduced concentration of blood cortisol and increased blood glucose.

• Improved calf care during and immediately after birth may not only decrease the percentage of stillbirths but also decrease the proportion of calves that die between 1 and 120 days of age.

• Dystocia and subsequent health events in this study accounted for nearly 50% of all calf deaths.

• Education of farm personnel should be targeted at minimizing dystocia impacts with appropriate delivery methods, identifying compromised calves, administering fluids and oxygen to calves with acidosis, warming chilled calves and delivering high-quality colostrum immediately after birth. Standard operating procedures on dairies should be to treat every calf that was exposed to dystocia as a compromised calf.

The most recent stillbirth study, done in New York (Bicalho et al., 2007) by the Cornell Veterinary College, found 6.6% stillbirths out of 13,608 calvings, with 10.7% for first-calf heifers and 4% for older cows.

The particular significance of this study was its emphasis on cow effects after a stillbirth. Bicalho et al. found no detrimental effect of stillbirth on dam survival, even if the stillbirth calving was unassisted. However, they also found that stillbirths resulted in increasing the conception interval 88 days, and these dams had a 24% lower pregnancy rate compared to cows with a live calf.

Perhaps somewhat surprisingly, these detrimental effects of stillbirth calvings on dam reproductive performance were independent of calving difficulty.

Finally, as of last year, genetic evaluations for stillbirths are available as part of the list of genetic evaluations for fitness traits (Cassell, 2006). This recognizes that stillborn calves are an economic loss and that sire selection will affect the bottom line of dairy herds.

The Bottom Line

"The profound negative impact that a dystocia delivery has on calf health and survival paired with the subsequent effect on future dairy production should make calving management a larger priority on dairies. ... Underreporting (based on a 2002 National Animal Health Monitoring System survey) suggests that dairy producers undervalue the importance of dystocia in their operations and highlights the opinion of the authors of this study that dairy producers do not emphasize management and monitoring calving, dystocia and newborn calf survival. ... If dystocia is not actively monitored on dairy operations, it cannot be recognized as a priority by management. ... Decreasing the number of dams that require delivery assistance and improving dystocia relief methods should be goals of all dairy operations," Lombard et al. concluded.

Add to those comments the negative impact on dam reproductive performance (Bicalho et al., 2007).

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