Relationship between beef calf and dam serum L-lactate at varying degrees of calving difficulty

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Introduction

Dystocia & L-lactate

- Dystocia create hypoxemia in calves (Murray et al. 2015)
- Muscles produce L-lactate during anaerobic glycolysis (Bleul et al. 2014)
- Correlation between L-lactate level and blood pH (Homerosky et al. 2017)
- Mixed metabolic-respiratory acidosis (Franklin 1993)

Clinical Relevance

- L-lactate is elevated in assisted calvings (Homerosky et al. 2017)
- Also associated with reduced calf vigour (Homerosky et al. 2017)
- L-lactate higher than expected (Sorge et al. 2009)
- Is the L-lactate produced solely by the calf or acquired from the dam?

Objective

- To compare blood L-lactate concentrations between newborn beef calves and their dams;
- To assess if this relationship varies by levels of calving difficulty.

Sampling

- 44 cow-calf pairs
- 10 minutes after parturition
- Serum frozen -80°C
- Categorized based on calving difficulty
  - Unassisted
  - Easy Assist
  - Difficult Assist

Laboratory Analysis

- Thawed to 21°C
- Measured L-lactate on validated STAT Profile pHOx Ultra™ (STATP) (Buczinski et al. 2009)
Descriptive Statistics

Introduction Background

Objective

Materials and Methods

Results

Discussion

Conclusion

Correlation by Calving Ease

n | Correlation Coefficient | P value
---|------------------------|-------
Unassisted | 13 | 0.70 | 0.008
Easy Assist | 11 | -0.16 | 0.63
Difficult Assist | 20 | 0.29 | 0.22
Overall | 44 | 0.39 | 0.001

L-lactate by Calving Ease

Calves have higher median lactate values than cows overall, and within calving ease category (P<0.0003)

Correlation between Calf & Dam

Is there a relationship?

Overall, statistical correlation but not consistent across categories of calving difficulty
Moderate correlation in unassisted calvings, likely due to low variation
High levels in assisted calves likely self-generated

Conclusion

Calf blood L-lactate concentrations are not consistently related to those of their dam, particularly in assisted births. Therefore, the newborn calf should still be evaluated to assess its degree of compromise, regardless of calving difficulty or status of the dam.
References

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QUESTIONS?