

**Iowa Beef Industry Council Checkoff Research Program
Final Report Review**

Project Title: Effects of housing cow-calf pairs in dry-lots vs pasture during the summer on cow and calf performance

Investigators: Dr. Daniel Shike Mr. Travis Meteer Mr. Lucas Trindade Neira

Primary Institution: University of Illinois

Award Amount: \$96,080

Reviewer: Dr. James Russell

Date: March 4, 2022

Project Objectives:

- Evaluate the effects of housing cow-calf pairs in dry lots or pasture during the summer on cow performance, health, lactation, and reproduction as well as calf performance and health through weaning
- Evaluate the effects of housing cow-calf pairs in dry lots or pasture during the summer on post-weaning calf performance, behavior, and health during the feedlot receiving phase

Final Report Summary

Nontechnical Summary:

Title: Effects of housing cow-calf pairs in dry-lots vs pasture during the summer on cow and calf performance.

Lead Project Director:

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A 2-yr study was conducted to evaluate the effects of housing cow-calf pairs in dry lots or pasture on cow performance and reproduction as well as calf performance and behavior through feedlot receiving. Simmental × Angus (108/yr.; 81 ± 15.3 d postpartum) spring-calving cows were stratified by age, body weight, body condition score, and calf sex and allotted to six groups/yr. Cows in dry lots were limit-fed at maintenance and calves had ad libitum access to the cow diet in an adjacent pen. Pairs on pasture rotationally grazed tall fescue pastures and calves received creep feed ad libitum three weeks prior to weaning. Calves were fence-line weaned for 6 days and behavior was observed 2 days post weaning to determine differences in weaning stress. Calves then entered a feedlot for a 42-d receiving period. Cows on dry lot had greater body weight at weaning and greater milk production but there were no differences detected in body condition score or pregnancy rates. There was a large numerical difference in the percentage of cows treated for either foot rot or digital dermatitis, 36% of dry lot

cows were treated at least once whereas only 5% of pasture cows were treated. Dry lot calves had greater body weight and gains throughout the summer and at weaning. On the first day of post-weaning behavior observations, more dry lot calves were eating in the morning hours and lying in the evening whereas pasture calves were lying in the morning hours and eating in the evening hours. Pasture calves vocalized and walked more on the second day post-weaning. Pasture calves also had greater dry matter intake during the fence-line wean. Upon arrival to the feedlot, more dry lot calves were walking and vocalizing whereas more pasture calves were lying and eating. Pasture calves had increased gains and feed efficiency during the receiving phase; however, they never fully compensated and were still lighter than the dry lot calves at the end of the experiment. In conclusion, housing cow-calf pairs in dry lots improved body weight and milk production of cows but did not affect reproductive performance. Dry lot calves had increased body weight and gains during the preweaning phase. Calf behavior at weaning and receiving was influenced by preweaning housing. Pasture calves had improved receiving phase gains and feed efficiency but were still lighter than dry lot calves after 42 d receiving phase. Dry lot systems are a viable alternative for producers with limited pasture availability and access to low-cost feedstuffs. More research is needed to fully understand the long-term effects of housing cattle in these production systems.

Impacts:

- Dry lot housing for cow-calf pairs is a viable option as a system for summer months.
 - Cow performance is more predictable in a dry lot compared to pastures
 - Dependent on weather and forage availability and quality
 - Cow foot health seems affected by the dry lot environment.
- Dry lot housing cow-calf pairs results in heavier calves
 - Calves raised in dry lots are better adapted to feed and dry lot environments at weaning than pasture-raised calves.
- Regional variability in pasture availability and price as well as feedstuff availability and price will impact the feasibility and affordability of a dry lot system.

Conclusion:

- Housing cow-calf pairs in dry lots resulted in increased body weights, body condition scores, and milk production compared to cows on pasture
 - But reproduction efficiency was not affected by management system.
 - Housing cow-calf pairs did tend to increase lameness.
- Calves raised in a dry lot had greater body weight during the preweaning stage and maintained the bodyweight advantage through the 42-d receiving phase.
 - Calves raised in pasture had greater daily body weight gains and gain: feed ratio during the 42-d receiving phase, but did not compensate enough to achieve similar weights to calves raised in a dry lot at the end of a 42-day receiving phase.

Technology transfer:**Graduate student theses or dissertations:**

None reported

Refereed journal publications:

Myerscough, M. E., L. T. Neira, K. H. Sexton, L. S. Hofer, K. M. Trennepohl, W. T. Metter, W. P. Chapple, J. C. McCann, and D. W. Shike. 2022. Effects of housing beef cow-calf pairs on dry lot or pasture in the Midwest on production parameters and calf behavior through feedlot receiving. *J. Anim. Sci.* 100 (1):1-13. doi: 10.1093/jas/skab35

Reviewed abstracts:

M. E. Myerscough, W. P. Chapple, W. T. Meteer, D. W. Shike. Effects of housing cow-calf pairs on dry lots vs pasture on calf performance and behavior during the receiving phase. ASAS Midwest Animal Science Meeting. Virtual. March 2021.

M. E. Myerscough, W. P. Chapple, W. T. Meteer, D. W. Shike. Effects of housing cow-calf pairs on dry lots vs pasture on calf performance and behavior through weaning. ASAS Midwest Animal Science Meeting. Virtual. March 2021.

L. S. Hofer, M. E. Myerscough, W. P. Chapple, W. T. Meteer, K. M. Trennepohl, J. C. McCann, D. W. Shike. Cow performance and lameness are affected by housing in dry lots vs pasture during the summer. ASAS Midwest Animal Science Meeting. Virtual. March 2021.

K. H. Sexton, M. E. Myerscough, W. P. Chapple, W. T. Meteer, K. M. Trennepohl, J. C. McCann, D. W. Shike. Effects of housing cow-calf pairs in dry lots vs pasture during the summer on cow performance. ASAS Midwest Animal Science Meeting. Omaha, NE. March 2020

Extension/Outreach publications:

M. E. Myerscough. Evaluation of a dry lot housing system for cow calf pairs. Orr Beef Research Field Day. November 5, 2020.

Scientific presentations:

M. E. Myerscough, W. P. Chapple, W. T. Meteer, D. W. Shike. Effects of housing cow-calf pairs on dry lots vs pasture on calf performance and behavior during the receiving phase. ASAS Midwest Animal Science Meeting. Virtual. March 2021.

M. E. Myerscough, W. P. Chapple, W. T. Meteer, D. W. Shike. Effects of housing cow-calf pairs on dry lots vs pasture on calf performance and behavior through weaning. ASAS Midwest Animal Science Meeting. Virtual. March 2021.

L. S. Hofer, M. E. Myerscough, W. P. Chapple, W. T. Meteer, K. M. Trennepohl, J. C. McCann, D. W. Shike. Cow performance and lameness are affected by housing in dry lots vs pasture during the summer. ASAS Midwest Animal Science Meeting. Virtual. March 2021.

K. H. Sexton, M. E. Myerscough, W. P. Chapple, W. T. Meteer, K. M. Trennepohl, J. C. McCann, D. W. Shike. Effects of housing cow-calf pairs in dry lots vs pasture during the summer on cow performance. ASAS Midwest Animal Science Meeting. Omaha, NE. March 2020

Extension/Outreach presentations:

Midwestern beef production works just as well off of pasture. College of ACES by Lauren Quinn.
<https://aces.illinois.edu/news/midwestern-beef-production-worksjust-well-pasture>

Podcasts:

None reported

Other:

None reported

Personnel Support:**Faculty:**

None

Extension specialists:

None

Associate scientists:

None

Post-doctoral associates:

None

Technicians:

None

Farm labor:

None

Graduate student:

Megan Myerscough, \$47,162.77

Undergraduate student:

Keifer Sexton (Leveraged funding)
Lucas Hofer (Leveraged funding)

Other:

None

Leveraged funds:

USDA-supported Illinois Beef Experiential Learning and Industry Exposure Fellowship (I-BELIEF) supported two undergraduate students in this project.