

Effect of Herd Background on Feedlot Cattle Performance

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Introduction

Cattle performance varies based on influence by environment, diet and genetic factors. Eliminating environmental and diet variation allows comparison of feedlot animals with different genetic backgrounds. Fifteen steers were fed from each of three operations (Minnesota, Nebraska and South Dakota). Blood samples were collected on all steers for future genotypic correlation to feed efficiency.

Objective

- Steers were fed a common diet to determine the genetic contribution to feedlot performance.

Objectives of Science With Practice

- Continue to learn more about how research is conducted and be able to understand the reasons why the study is being done.
- To learn more about nutrition in beef cattle and put it into context with my feedlot cattle background.
- Learn new techniques used in the lab and be the employee that can accomplish tasks to the best of my ability.
- Be able to participate in a research project from start to finish and learn about what is put into a research study.

Impact of Science With Practice

- Science With Practice has given me the opportunity to learn about research, how it is conducted and the processes involved.
- Through Science With Practice, I was able to work with graduate students and get a sense of how the graduate programs works.
- Being involved in Science With Practice has helped me become a more organized, confident and independent Iowa State student.

Hypothesis

- Variation in feedlot cattle performance is influenced by genetic differences.

Tasks Completed

- Grinding feed samples into a substance that can be tested
- Weighing feed samples for the ashing process
- Ashing feed samples to be analyzed for minerals
- Helping sort and weigh steers at Beef Nutrition Farm
- Labeling microcentrifuges tubes to be used in blood work
- Entering data on the steers in a spreadsheet
- Interpreting results of an experiment



Left: In this photo I am weighing my feed samples to be ashed. Ashing is a process that breaks down the feed sample into a liquid substance that can be sent through a machine to measure mineral content in the feed. Above: This is a photo of the Limousin steers at the Ruminant Nutrition Farm in Ames, Iowa.

Materials and Methods

- Limousin steers n = 45 were divided into 7 pens.
- Steers were weighed on day 0, 14, 28, 42.
- Ultrasound data and hip heights were collected on day 0 and will be collected again on day 77.
- Blood samples were collected on day 0 for genotyping.
- Ivermectin pour-on was administered at the beginning of the growing period to prevent internal and external parasites.
- Steers received vaccinations prior to feedlot introduction.
- Steers were fed a corn silage-based growing diet balanced to meet protein, energy, vitamin and mineral requirements based on NRC recommendations.
- Growing diet contained 200 mg monensin/hd/day (Rumensin 90, Elanco Animal Health, IN)

Table 1
Comparison of Herd Backgrounds

	Nebraska	Minnesota	South Dakota	SEM	P- Value
Initial Weight (lbs)	764	771	770	18	0.9
Final Weight (lbs)	924	938	920	19	0.6
DMI (lbs/d)	17.9	18.1	18.5	0.7	0.8
ADG (lbs/d)	3.7 ^{ab}	3.9 ^a	3.5 ^b	0.1	0.03
Gain:Feed	0.21 ^{ab}	0.22 ^a	0.19 ^b	0.01	0.06

Results

- There was no difference in initial weight and final weight between farms ($P > 0.6$) (Table 1).
- During the feeding period, there was no difference in dry matter intake ($P = 0.8$) (Table 1).
- Steers from the Minnesota farm had a greater average daily gain and gain:feed than the steers from South Dakota (Table 1), and Nebraska steers were an intermediate.
- Cattle will remain on feed for an additional 36 days to further investigate differences in growth performance.
- Genotypes will be correlated with overall feedlot performance and carcass characteristics.
- The difference in gain:feed is due to variation in average daily gain because dry matter intakes did not differ. (Table 1)

Conclusion

Feedlot performance varies between differing genetic backgrounds within a breed. Science With Practice has helped me explore graduate school and possible careers options in the field of ruminant nutrition. I am excited to see if there is a correlation between genotypes and feedlot performance.

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