Final Report Review

Project Title: Improving profitability for integrated farming/feeding operations by using more corn silage and prevention of liver abscesses

Principal investigator: Dr. Galen Erickson

Co-investigator(s): None

Primary institution: University of Nebraska-Lincoln

Award Amount: $57,375.

Project Dates: November 1, 2018 – July 1, 2019

Reviewer: Dr. James Russell

Date: September 6, 2019

Project Objective:

- To determine if an increase in corn silage in finishing diets for cattle would decrease the incidence of liver abscesses without the inclusion of tylosin.
    - Thus, reducing the need for veterinary approval documentation as required by the Veterinary Feed Directive.

Project Results:

- Beef steers fed 45% corn silage (DM basis) had lower average daily gains (ADG) and poorer feed-to-gain (F:G) ratios, but greater final bodyweights when fed to a common backfat thickness than cattle fed 15% corn silage regardless of tylosin supplementation.
- Feeding 45% corn silage reduced the incidence and severity of liver abscesses to an equal or greater extent than tylosin supplementation.
- Feeding 45% corn silage tended to be more profitable than feeding 15% corn silage at a corn grain price of $3.67/bu with this difference increasing as corn prices increased.

Final Report Summary

Nontechnical Summary

Title: Improving profitability for integrated farming/feeding operations by using more corn silage and prevention of liver abscesses

Lead Project Director:

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Feeding more corn silage than traditional inclusions has been researched recently as feeding more silage in farming and feeding operations will improve profitability, despite decreased gain and feed usage or conversion. Feeding more silage may decrease liver abscesses and the need for antibiotic control of abscesses. A finishing study was conducted to assess the impact of increased corn silage inclusions in high concentrate finishing diets to reduce the incidence of liver abscesses in beef cattle. A total of 640 steers were utilized in a 2 × 2 factorial treatment design with two levels of corn silage (15 and 45% of the diet DM), with or without an antibiotic fed for control of abscesses. This study utilized 32 pens of cattle with 20 steers per pen and 8 pens per treatment. There was an interaction for liver abscesses between feeding silage or an antibiotic. Cattle fed 15% corn silage had the greatest incidence of liver abscesses (34.5%) compared to all other treatments (P = 0.05), and abscess rate was decreased to 19% if an antibiotic was fed. Feeding 45% silage was also effective at lowering liver abscess rates which were 12.4% regardless of whether an antibiotic was fed. Therefore, feeding corn silage at 45% was as effective as feeding an antibiotic to cattle on 85% concentrate diets. Feeding corn silage at greater inclusions decreased gain and increased conversion but increased final body weight when fed to an equal fatness. To get them at equal fatness, cattle fed 45% silage were fed an additional 28 days. Feeding corn silage at 45% was more economical compared to feeding 15% corn silage, especially at higher corn prices. The economics of feeding corn silage are dependent on how silage is priced and how well shrink is managed when ensiling occurs at harvest.

Impacts

- While feeding cattle 45% silage instead of 15%, as is typical, decreased ADG and increased feed conversion (F:G), feeding more silage was very effective at decreasing liver abscesses.
- If more silage is fed (up to 45%), then cattle need to be fed longer to get to a similar fat endpoint so grade is not hindered.
    - This is approximately 28 days if increasing dietary silage inclusion from 15 to 45%.
    - By feeding 28 days longer, we are able to sell more carcass weight (and live weight).
- Despite more yardage and feed inputs, the cost of the 45% corn silage diet was enough cheaper, and the cattle slightly heavier (27 lb. more carcass weight) which allows for the cattle to be more profitable.
    - The increased profit is approximately $10.50 per head.
    - The profit projection is based on how silage is priced, and that shrink of silage is well managed.

Conclusion:

- Cattle feeders in Iowa that own their own farm acres to put up silage and concentrate on how to put silage up well, can avoid the use of antibiotics (and the requirement of a veterinary feed directive) to prevent liver abscesses if they feed 45% corn silage (DM basis) to finishing diets. That management change will also enhance their profitability of the farming/feeding operation.

Technology transfer:

Reviewed journal publications:

One planned

Graduate student dissertations/thesis:

EVALUATION OF NOVEL ADDITIVES AND CORN SILAGE AS NATURAL ALTERNATIVES TO ANTIBIOTICS FOR THE PREVENTION OF RUMINAL ACIDOSIS AND LIVER ABSCESSES IN BEEF FINISHING CATTLE, University of Nebraska-Lincoln, 5/8/20

Extension/Outreach publications:

Effect of Increasing Corn Silage Inclusion in Finishing Diets with or Without Tylosin on Performance and Liver Abscesses. 2021 Nebraska Beef Cattle Report. (Available November, 2020).

Scientific presentations:

2020 ASAS-ADSA Meeting (Graduate Student Oral Competition – PHD)

- Presentation Title: Effect of Increasing Corn Silage Inclusion in Finishing Diets with or Without Tylosin on Performance and Liver Abscesses
- Monday March 2, 2020
- **Outcome:** Published abstract in Journal of Animal Science (Not yet available)**,** Oral presentation to industry professionals

High Plains Nutrition & Management Roundtable (Poster Competition)

- Thursday, October 3, 2019
- Colorado State University, Fort Collins, CO
- **Outcome**: Poster available to industry professionals, Placed 1st

2019 Husker Beef Nutrition Conference (Oral Presentation)

- Friday, November 15, 2019
- UNL Eastern Nebraska Research and Extension Center, Mead, NE
- **Outcome:** Distributed proceeding paper and gave an oral presentation to industry professionals

Extension/Outreach presentations:

Presented at the Eastern Iowa Feedlot Clinic in my presentation on "Utilizing corn silage in growing and finishing diets" Galen Erickson, Welton, IA, 8/9/19. Approximately 40 attendees

Presented at Driftless Beef Conference in presentation "Use of corn silage in growing and finishing beef systems", Dubuque, IA, 1/30/20

Presented at the Nebraska Beef Feedlot Roundtable in the presentation "Decreasing antibiotic reliance", Lexington, NE 2/19/20.

Presented at the Nebraska Beef Feedlot Roundtable in the presentation "Decreasing antibiotic reliance", West Point, NE (livestreamed to 3 sites in Iowa) 2/20/20

Personnel Support:

Faculty:

None

Post-doctoral associates:

None

Technicians:

Partial support on unclear number

Farm labor:

None

Graduate students:

1

Undergraduate students:

None

Other:

None

Leveraged funds:

None