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Pooled Gain Analysis of Steers Grazing Corn Residue and Supplemented with Distillers Grains

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Summary with Implications

A pooled analysis combined data from three trials in which steer calves grazing corn residue were supplemented with distillers grains at varying amounts as a percent of BW. A regression equation was calculated in order to provide an accurate estimate of gain for calves fed distillers grains at various rates. Steers supplemented with distillers grains in a range from 0.3 to 1.1% of BW (1.5 to 6.5 lb / steer daily) had estimated gains that ranged from 1.07 to 1.94 lb / d. This prediction equation provides an estimate of gain for calves supplemented with distillers grains at various rates while grazing corn residue under normal environmental conditions.

Introduction

Corn residue is a relatively inexpensive, grazable forage source in many parts of Nebraska. However, due to its low levels of protein and energy, it is necessary to provide a supplemental nutrient source for growing calves to meet their growth requirements (*2016 Nebraska Beef Report,* pp. 31–32). Distillers grains plus solubles (DGS) fits well as a supplement for calves grazing corn residue, as it is high in both protein (~30% CP) and energy (108% TDN). An estimate of calf ADG, relative to amount of DGS fed, is important to have so that producers can achieve a desired level of gain. The objective of this analysis was to combine ADG data from previous trials into a pooled analysis that would provide an equation from which ADG could be estimated depending on rate of DGS supplementation (as a percent of BW).

Procedure

A pooled analysis was conducted utilizing data from 3 corn residue grazing trials conducted from early November to early February at the University of Nebraska-Lincoln Eastern Nebraska Research and Extension Center near Mead, NE. In all 3 trials, steer calves grazing corn residue were supplemented with distillers grains at differing rates. The first trial (*2006 Nebraska Beef Report, pp. 36–37*) utilized 120 steers (512 lb, ± 37) that were fed dried distillers grains (DDGS) at either 0.29, 0.49, 0.69, 0.88, 1.08, or 1.27% of BW which equated to a range of 1.5 to 6.5 lb of DDGS / steer daily (DM basis). The second trial (*2014 Nebraska Beef Report, pp. 48–49*) utilized 120 steers (435 lb, ± 16) fed either modified distillers grains (MDGS) or DDGS at 0.3, 0.7, or 1.1% of BW (1.4 to 5.4 lb / steer daily on a DM basis). There were no differences in ADG due to distillers type (P =0.51), therefore gains were pooled together for this analysis. The third trial (*2015 Nebraska Beef Report, pp. 25–26*) utilized 60 steers (519 lb, ± 11) fed DDGS at 0.3, 0.5, 0.7, 0.9, or 1.1% of BW (1.7 to 6.8 lb / steer daily on a DM basis). Steers in the second and third trial received monensin at 200 mg / steer and limestone at 60 g / steer daily and were implanted with Ralgro® at the beginning of the trial. In all trials, steers were individually supplemented daily via Calan gates. Results for each trial can be seen in Figure 1.

Estimated available forage was divided by estimated DMI (10 lb / steer daily) to determine the number of grazing days the field could support. Data were pooled using the MIXED procedure of SAS (SAS Institute Inc., Cary, N.C.). Calf was the experimental unit and data were blocked by weight within trial and trial was included in the model. A regression equation was calculated using the average calculated ADG of calves in the 3 trials when DGS was supplemented at 0.3, 0.5, 0.7, 0.9, and 1.1% of BW.

Results

A regression line and equation were calculated utilizing the 3 pooled datasets (Figure 2). As rate of DGS supplemention increased, there was a quadratic increase in ADG (P = 0.06). Estimates of ADG for steers fed DGS at 0.3, 0.5, 0.7, 0.9, and 1.1% of BW were 1.07, 1.36, 1.60, 1.80, and 1.94 lb / d, respectively. This analysis agrees with previous research in which DDGS was fed at 0.52% of BW to steers grazing corn

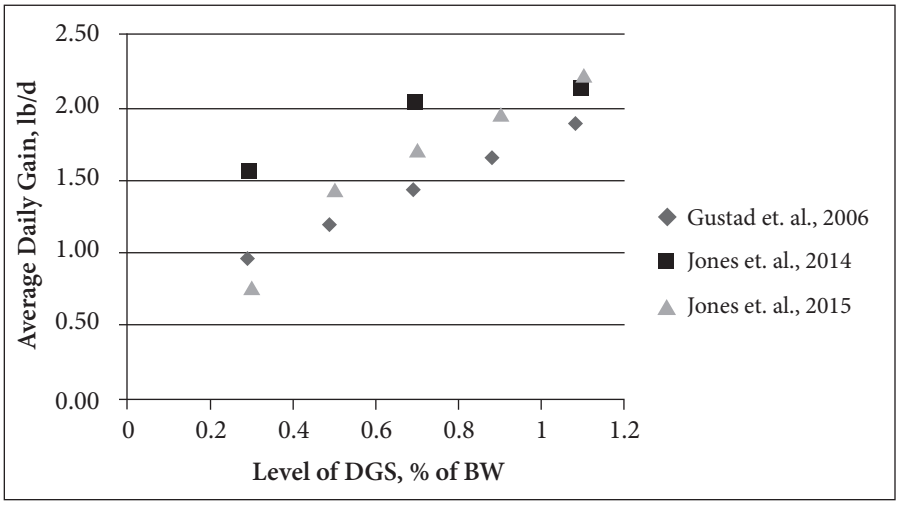

Figure 1. Effect of level of DGS supplement on ADG of steers across trials

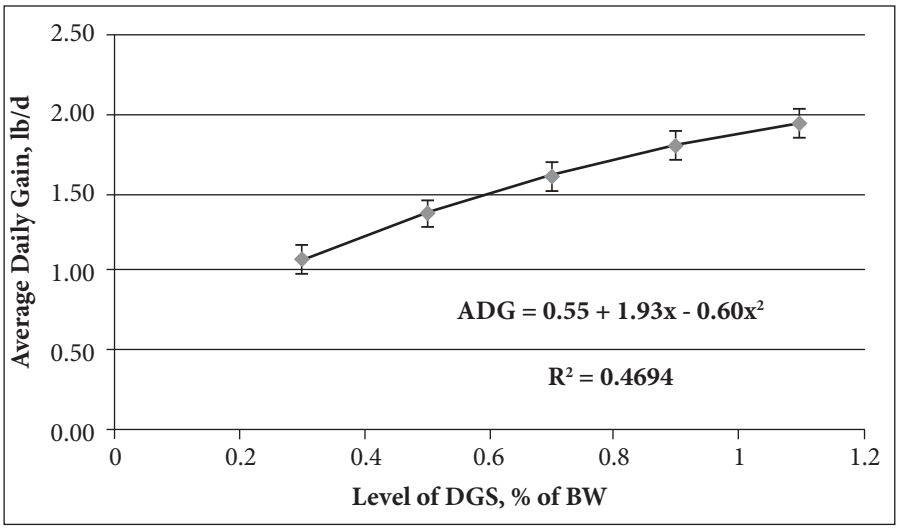

Figure 2. Effect of rate of DGS supplement on ADG of steer calves grazing corn residue (Linear response—$P < 0.01$; Quadratic response—$P = 0.06$)

residue and ADG was 1.32 lb / d (predicted ADG = 1.39 lb/d) (*2016 Nebraska Beef Report, pp. 31–32*). Additionally, in another study evaluating performance of calves grazing corn residue, steers were supplemented with DDGS at 0.86% of BW and gained 1.77 lb / d which matches the ADG calculated using this prediction equation (*2016 Nebraska Beef Report, pp. 55–56*).

Conclusion

Overall, as supplementation rate of DGS increases, so does ADG. However, at higher rates of supplementation, added gain increases at a decreasing rate. This prediction equation can provide, under normal environmental conditions, a reasonable estimate of gain for calves supplemented with DGS at various rates while grazing corn residue.

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