



EXTENSION

BEEF CATTLE RESEARCH UPDATE

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Use of Syngenta Enhanced Feed Corn (Enogen) in Feedlot Diets

Syngenta Seeds developed Enogen® Feed Corn that has been genetically enhanced to contain an α -amylase enzyme trait to enhance ethanol production. Research has evaluated the performance of cattle fed this Enogen Feed Corn (EFC) since this trait may increase post-ruminal starch digestion, resulting in improved animal performance. Research at the University of Nebraska (2016) showed that feeding EFC as dry-rolled corn improved feed conversion (Feed/Gain ratio) by 2.6% to 16.4% of feedlot cattle as compared to cattle fed corn not containing the α -amylase enzyme trait.^{1,2} However, in a 2018 Nebraska trial, feed EFC as dry-rolled corn only improved feed conversion by 1.6%.³ However, improvements in feed efficiency have not been observed when feeding EFC as high-moisture corn.²

More recent University of Nebraska research (2020) evaluated comparing EFC corn to commercially available corn without the α -amylase enzyme trait when used as a silage in growing cattle diets and also how dry-rolled EFC corn would work in a hay based growing diet.⁴ These researchers reported that feeding growing cattle (674 lb initial weight) EFC corn silage did not improve any of the feed performance characteristics when compared to traditional silage when fed at 80% (dry matter basis, DM) of the diet in the 84-day trial. In addition, feeding growing cattle dry-rolled EFC did not have any effect on performance when compared to traditional dry-rolled corn when fed at 40% of the diet with 40% grass hay (DM basis).

A University of Nebraska finishing study (2020) evaluated the effect of corn hybrid and processing type on finishing performance of yearling steers.⁵ In this 148-day study utilizing 336 crossbred yearling steers (919 lb initial weight), conventional commercial corn (CON) and EFC was processed and fed as dry-rolled corn (DRC), high-moisture corn (HMC), or a 50:50 blend of the two. Feed conversion was numerically improved by 2.9 and 2.1% in cattle fed EFC as DRC or a 50:50 ratio of DRC:HMC, respectively, as compared to control corn. Average daily gain was similar when comparing EFC to CON when fed as DRC or the 50:50 blend of DRC and HMC. For cattle fed HMC, ADG and feed efficiency were better for CON compared to EFC (3.78 vs. 3.58 lb/day and 6.41 vs. 6.66, respectively). These researchers concluded that feeding EFC may improve performance when processed as DRC.

Kansas State University research (2018) evaluated the performance of growing cattle when fed EFC.⁶ In this study, 384 English crossbred steers (average initial weight of 538 lb) were fed in 2 × 2 factorial design with two varieties of corn (Enogen vs. yellow) and two methods of corn processing (dry-rolled vs. whole-shelled). The diets contained 28.6% corn (dry matter basis, DM) and were fed ad libitum for 90 days. These researchers reported that DM intake over the entire 90-day trial for calves fed EFC tended to be 2.9% lower ($P < 0.09$) than for calves fed yellow corn (20.45 vs. 21.05 lb/day). Average daily gain (ADG) also tended to be greater ($P < 0.10$) for calves fed EFC (3.43 vs. 3.35 lb/day) over the entire 90-day trial. As a result, feed efficiency (Feed/Gain) was improved by 5.2% ($P < 0.01$) in calves fed EFC. These researchers also noted that as early as day 35, feed efficiency tended to be greater for Enogen-fed calves ($P < 0.07$). For the remainder of the study (days 63 to 90), feed efficiency was significantly greater for calves fed EFC ($P < 0.01$). These authors concluded that by using a variety of corn that provides the alpha amylase expression trait, producers can reduce feed costs while maximizing performance.

Kansas State University research (2019) evaluated the performance of growing cattle when fed Enogen Feed corn silage.⁷ In this study, 352 crossbred steers (656 lb initial weight) were allocated to 32 pens 1 of 4 treatments (8 pens /treatment). The four treatment diets were formulated to

provide 50 Mcal NEg/cwt DM and all diets were offered ad libitum. The experiment was a 2 x 2 factorial design with two varieties of corn silage (EFC vs. control) and two varieties of dry-rolled corn (EFC vs. control). The diets (DM basis) consisted of 38.5% corn, 40% corn silage, 7% alfalfa hay, 7% prairie hay, and 7.5% supplement. Diets were fed ad libitum. Over the entire 90-day trial, average daily gain for calves fed EFC silage was 6.0% greater ($P < 0.01$) than for calves fed control silage. Feeding EFC silage improved the efficiency of feed conversion by 4.4% ($P < 0.02$). No significant effects of corn grain type were noted over the trial, nor any significant interactions between corn silage type and corn grain type.

Another 2018 Kansas State University trial, examined the steam-flaking characteristics of EFC and its impact on feedlot performance, carcass characteristics, and liver abscess prevalence and severity when fed to finishing beef heifers.⁸ In this trial, finishing diets (93% concentrate) consisting of mill-run corn (CON) or EFC were fed to 700 crossbred beef heifers (867 lb initial weight) over 136 days. Mill-run corn was steam-flaked to 28 lb/bu with a production rate of 6.6 tons/hour. To achieve similar starch availability, EFC was steam-flaked to 30 lb/bu with a production rate of 9.9 tons/hour. These researchers reported that DM intake was similar between treatments, but cattle fed EFC had greater ADG, resulting in a 5% improvement in feed efficiency. Hot carcass weights (HCW) were 13 lb greater for cattle fed EFC compared to those fed CON. Heifers fed EFC had fewer liver abscesses compared to cattle fed CON. These authors concluded that EFC can be flaked with greater throughput while still improving feed efficiency, ADG, and HCW.

Kansas State University research (2019) evaluated feeding Enogen Feed corn as corn silage and as steam-flaked corn in diets fed to finishing cattle.⁹ In this trial, 960 steers (856 lb initial weight) were used in a 2 x 2 factorial experiment with factors consisting of silage source (Control or EFC) and grain source (Control or EFC). The grains were steam flaked to densities of 28 lb/bu or 30 lb/bu for Control and EFC, respectively. The diets (DM basis) consisted of 8% corn silage, 2% alfalfa hay, 74.5% flaked corn, 12% Sweet Bran, and a supplement. These researchers reported that there were no interactions between grain source and silage source ($P > 0.05$) for feedlot performance. Cattle fed diets containing EFC silage consumed 3.8% less dry matter ($P < 0.01$) and efficiency of gain was improved by ~5.3% ($P < 0.01$) compared to cattle fed Control silage. Average daily gain and DM intake were unaffected by grain source, but cattle fed EFC grain were ~2.6% more efficient ($P = 0.02$) compared to cattle fed control grain. Carcass weight was greater for cattle fed the combination of Enogen silage and Control grain compared to other treatments ($P < 0.05$), but liver abscess incidence and other carcass measurements were unaffected by grain or silage source. These researchers concluded that feeding EFC as corn silage, but not as grain, improved feedlot performance.

In conclusion, the results of the Nebraska studies suggest that feeding Enogen Feed Corn as dry-rolled corn to growing and/or finishing feedlot cattle will improve feed efficiency. However, feeding EFC as high-moisture corn will not improve feed efficiency. Their data also suggested that EFC corn silage to growing cattle at 80% of the diet (DM basis) did not improve feed efficiency compared to traditional silage. Similar to the Nebraska studies, the Kansas research suggest that feeding EFC either dry-rolled or whole-shelled to growing cattle improves feed efficiency. In addition, feeding growing cattle EFC corn silage at 40% of the diet (DM basis) improved feed efficiency. A finishing trial also suggested that feeding EFC corn silage will improve feed efficiency. Kansas research also suggest that EFC can be flaked with greater throughput while still improving feed efficiency.

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