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Syngenta Enhanced Feed Corn (Enogen) Containing an Alpha Amylase Expression Trait Improves Feed Efficiency in Growing Calf Diets

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Abstract

Objective: To determine the response of growing calves when fed Enogen Feed (Syngenta) corn, containing an alpha amylase expression trait.

Description: A total of 384 English crossbred steers having an average weight of 538 lb and originating from Texas were used to determine the effects on performance when fed Enogen Feed corn as either whole shelled or processed as dry-rolled at ad libitum intake.

The Bottom Line: When fed in an ad libitum fashion to growing calves, Enogen Feed corn improves feed efficiency of growing calves by 5.50%.

Keywords

corn, alpha amylase, growing calf

Authors

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CATTLEMEN'S DAY 2018

Syngenta Enhanced Feed Corn (Enogen) Containing an Alpha Amylase Expression Trait Improves Feed Efficiency in Growing Calf Diets

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Introduction

Recent studies have been conducted to evaluate the alpha amylase enzyme expression trait in Enogen Feed corn on finishing beef cattle performance. The results suggest various but predominantly positive outcomes in feed efficiency when fed with either corn gluten feed (Sweet Bran) or modified wet distillers grains. Supporting metabolism work has determined that cattle fed Enogen Feed corn are able to utilize more starch from corn containing this trait, which provides them with more energy. It is not known if a similar response will be observed with growing cattle. Therefore, the objective of this study was to evaluate the health and performance of growing cattle when fed Enogen Feed corn.

Experimental Procedures

English crossbred steers (n=426), averaging 538 lb, were transported from a single source in Lazbuddie, TX, to the Kansas State University Beef Stocker Unit (approximately 565 mi), Manhattan, KS, on May 15, 2017. Upon arrival, all animals were vaccinated for viral and clostridial diseases and treated for internal and external parasites. On day 21, all research animals were revaccinated for respiratory diseases. Thirty-two pens were used (8 for each treatment), composed of 12 animals each. Thirty-two steers on the lower end of the weight spectrum and 10 steers on the higher end of the weight spectrum were removed from the research population. The remaining 384 steers were stratified by weight and randomly assigned to pens, which were randomly allocated to 1 of 4 treatments. The four treatment diets were formulated to provide 51 Mcal net energy for gain/100 lb dry matter and all were offered ad libitum intakes. The experiment was a 2 × 2 factorial design with two varieties of corn (Enogen Feed (Syngenta) vs. yellow) and two methods of corn processing (dry-rolled vs. whole-shelled). Pen was the experimental unit. The steers were fed their respective diets once daily at approximately 7:00 a.m. for 90 days. Individual animal weights were taken on days -1 (arrival), 0 (initial processing), 21 (revaccination), and 91 (final weights). Fecal starch samples were

[1]Syngenta Crop Protection, Greensboro, NC.

obtained individually on days 56 and 57 and analyzed the same week. Pen weights were collected on days 7, 14, 35, 63, and 77. Feed delivery was adjusted based on daily refusals to ensure ad libitum intakes without an excess of leftover feed. Bunk and individual ingredient samples were taken weekly.

Results and Discussion

During the entire 90-day trial, the dry matter intake for calves fed Enogen Feed corn tended to be lower ($P<0.09$) than for calves fed yellow corn (Table 2). This difference was especially apparent through day 14, where calves consumed more yellow corn feed than their Enogen-fed counterparts ($P<0.01$). Average daily gain and off-test weights tended to be greater ($P<0.10$) for calves fed Enogen Feed corn over the entire 90-day trial. Feed efficiency was greater in calves fed Enogen Feed corn ($P<0.01$). 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 Enogen Feed corn ($P<0.01$). Overall, the feed efficiency of calves receiving Enogen Feed corn was improved by 5.50%. By using a variety of corn that provides the alpha amylase expression trait, producers have the opportunity to capture the value of improved feed efficiency.

Implications

When fed in an ad libitum fashion to growing calves, Enogen Feed corn improves the efficiency of feed conversion by 5.50%. This response became apparent by day 35 and was a significant factor throughout the remainder of the study. There were no negative observations regarding cattle health or behavior with the feeding of Enogen Feed corn.

Table 1. Experimental diets

Ingredient	Dry matter %
Corn (variety × processing)[1]	28.57
Supplement	6.43
Alfalfa hay	17.50
Prairie hay	17.50
Wet distillers grains	30.00
Total	100.00
Composition	100% Dry matter basis
Dry matter, %	60.30
Protein, %	16.08
Calcium, %	0.85
Phosphorus, %	0.41
Salt, %	0.32
Potassium, %	1.09
Magnesium, %	0.22
Fat, %	4.72
Acid detergent fiber, %	20.59
Net energy for maintenance, Mcal/100 lb	78.81
Net energy for gain, Mcal/100 lb	51.13

[1]Corn Type: Enogen Feed (Syngenta) corn vs. yellow and fed as either whole shelled or dry rolled.

Table 2. Effects of corn source and corn processing on performance

	Corn source							
	Enogen[1]		Yellow					
	Corn process				Standard error of the mean	P-value		
Item	Dry-rolled	Whole	Dry-rolled	Whole		Process	Source	Process × source
Weight, lb								
Day								
0	539	538	539	537	1.08	0.33	0.77	0.59
7	571	570	570	569	1.91	0.70	0.80	0.85
14	606	606	604	610	1.96	0.14	0.49	0.14
35	675	677	671	676	2.53	0.17	0.32	0.54
63	757	766	752	757	3.99	0.09	0.07	0.64
77	801	808	792	793	6.89	0.62	0.10	0.68
91	850	851	838	847	4.29	0.24	0.10	0.34

continued

Table 2. Effects of corn source and corn processing on performance

	Corn source							
	Enogen[1]		Yellow					
	Corn process				Standard error of the mean	P-value		
Item	Dry-rolled	Whole	Dry-rolled	Whole		Process	Source	Process × source
Average daily gain, lb/day								
Day								
0 - 7	4.56	4.57	4.50	4.58	0.28	0.87	0.93	0.91
0 - 14	4.81	4.84	4.67	5.22	0.15	0.06	0.41	0.09
0 - 35	3.89	3.96	3.77	3.96	0.07	0.07	0.37	0.38
0 - 63	3.47	3.62	3.38	3.49	0.06	0.05	0.09	0.75
0 - 77	3.41	3.50	3.29	3.32	0.09	0.52	0.11	0.75
0 - 91	3.42	3.43	3.29	3.41	0.04	0.14	0.09	0.25
Dry matter intake, lb/day								
Day								
0 - 7	13.70	14.20	14.50	14.60	0.25	0.31	0.03	0.55
0 - 14	16.10	16.50	16.80	17.00	0.19	0.13	0.01	0.72
0 - 35	17.90	18.90	18.80	18.90	0.30	0.09	0.11	0.14
0 - 63	19.40	19.90	20.30	20.00	0.35	0.72	0.15	0.27
0 - 77	19.60	19.90	20.60	20.10	0.37	0.83	0.11	0.32
0 - 91	20.40	20.50	21.30	20.80	0.37	0.57	0.09	0.37
Feed-to-gain ratio, lb								
Day								
0 - 7	3.08	3.18	3.28	3.26	0.19	0.82	0.46	0.76
0 - 14	3.37	3.42	3.60	3.28	0.10	0.20	0.66	0.07
0 - 35	4.60	4.78	4.99	4.78	0.11	0.86	0.08	0.08
0 - 63	5.60	5.50	6.00	5.74	0.12	0.14	0.01	0.48
0 - 77	5.84	5.70	6.26	6.10	0.19	0.38	0.05	0.84
0 - 91	5.97	5.97	6.49	6.10	0.11	0.10	0.01	0.09
Gain-to-feed ratio, lb								
Day								
0 - 7	0.325	0.332	0.314	0.311	0.020	0.92	0.44	0.81
0 - 14	0.294	0.299	0.307	0.279	0.009	0.19	0.68	0.07
0 - 35	0.211	0.218	0.210	0.201	0.005	0.81	0.07	0.10
0 - 63	0.182	0.180	0.175	0.167	0.003	0.15	0.01	0.51
0 - 77	0.176	0.174	0.165	0.160	0.005	0.48	0.02	0.76
0 - 91	0.168	0.168	0.164	0.154	0.003	0.13	0.01	0.11

[1]Syngenta.