Effects of Condensed Corn Distillers Solubles on Steer Performance and Carcass Composition

A.S. Leaflet R2418

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Summary and Implications

Condensed corn distillers solubles (CCDS) have become a prevalent feed source in Iowa. In this study, we looked at the impact of CCDS in finishing steer rations and the influence CCDS had on steer performance as well as carcass composition. In the first year of the study, 112 steers were randomly sorted into four equal groups where each group contained four pens and 7 steers per pen. The second year of the study was a repeat of the first year however a fifth treatment was added in which 28 steers were placed on pasture and provided a finishing grain diet. The first of the four treatments consisted of the feedlot group (F), which was placed directly in to the feedlot and fed shelled corn, alfalfa hay, a protein, vitamin, and mineral supplement, and molasses. The second treatment was feedlot + CCDS (F+CCDS). This treatment group was placed directly into the feedlot and received shelled corn, alfalfa hay, a protein, vitamin and mineral supplement, and CCDS. The third treatment group was backgrounded on pasture for the duration of the summer (P), and then put into the feedlot where they received the same ration as the F group. The fourth treatment group was backgrounded on pasture for the duration of the summer, and while on pasture had access to free choice CCDS via a lick tank (P+CCDS). In the fall this group was placed into the feedlot and received the same ration as the F+CCDS group. In the second year, a fifth treatment was added, called the pasture finishing group (PF). The steers in this treatment received the same shelled corn, and protein, vitamin and mineral supplement, and CCDS as the cattle in the F+CCDS treatment, minus the alfalfa hay. Grass consumption for the PF cattle was estimated using the 2007 BRANDS program. Although the study is not yet completed, it appears as though CCDS can be implemented in feedlot rations successfully. The existing trends of the study would indicate that a feedlot ration containing CCDS will slightly increase steer ADG and improve F:G, without effecting QG.

Introduction

Our country's effort to reduce our dependency on foreign energy has opened the door to bio-fuels. The use of corn to make ethanol is of great importance in Iowa. Because of the dramatic increase in ethanol, there has been an equally dramatic increase in ethanol coproducts. This, coupled with the increase in corn prices, has encouraged nutritionists and producers alike to utilize the ethanol coproducts in beef cattle rations. This study looked at the use of condensed corn distillers solubles (CCDS) as a feed source for steers being backgrounded on pasture as well as steers being fed in the feedlot. In addition, a treatment group was finished on pasture with CCDS as a part of their ration. The two feedlot rations were isocaloric and isonitrogenous. The pasture finishing steers were fed a ration based on the feedlot ration containing CCDS but were not fed any hay. The goal of this study was to establish the benefits, as well as the limitations, of feeding CCDS to feedlot and backgrounded steers.

Materials and Methods

Feeder calves from central Midwestern state sale barns, descending from Angus and Angus crossbred genetics, were purchased for this study. The steers were fed at the Iowa State University Western Research Farm in Castana, IA. The feedlot flooring is solid cement and the feedlot offers shelter protection from northern exposure. Pasture conditions consist of two acre paddocks in which rotational grazing is utilized. All pastures are fertilized twice a year and consist of predominantly smooth brome grass. In the first year of the study, 112 steers were sorted by color, weight and purchasing location. They were randomly allotted into four treatment groups with 28 steers in each group and 7 steers per pen. The second year of the study a fifth treatment group was added. This treatment became part of the allotment process established during the first trial. The average beginning steer weight was 593 lb and 598 lb respectively; the average ending weight for both years was 1298 lb and 1305 lb, respectively. All steers were implanted with Compudose and injected with Ivomec at the beginning of each trial, and reimplanted with Revelor approximately 100 days prior to harvest. Assigned treatments for the first and second trials consisted of four and five treatments, respectively. The cattle in the feedlot treatment (F) received whole shelled corn, alfalfa hay, molasses, and a protein, vitamin, mineral, and Rumensin pelleted supplement. The cattle in the feedlot and CCDS treatment (F+CCDS) received a diet of whole shelled corn, alfalfa hay, CCDS, and a protein, vitamin, mineral, and Rumensin pelleted supplement, with the CCDS providing 25% of the ration on an as fed basis. The third and fourth groups of cattle were placed on rotational brome grass pastures with the cattle in the third treatment (P) receiving a vitamin, mineral and Rumensin supplement in block form. The cattle in the fourth

treatment (P+CCDS) received CCDS free choice in a lick tank along with a vitamin, mineral and Rumensin supplement. The pasture backgrounded steers were on rotational cool season pastures from May 15th until September 5th and May 31st until October 23rd, respectively, because pasture growth was unable to meet steer needs and pastures started to become dormant. When steers were brought into the feedlot from pasture, the P treatment was provided the same diet as F and the P+CCDS received the same diet as F+CCDS. Daily feed intake for P and P+CCDS treatments was calculated only for the drylot feeding period and, thus, F:G calculations for P and P+CCDS represents only the drylot feeding phase. In the second trial a fifth treatment was added to the study. This treatment of cattle was fed a diet similar to the cattle in the F+CCDS treatment, but instead of chopped hay, pasture served as their roughage source (PF). They remained on pasture for the duration of the study. The grass consumption of this treatment was estimated using the 2007 BRANDS program. At the time grain was introduced to the different treatment groups, all treatments were brought up on feed in a gradual manner. Dry matter (DM) percentages were calculated weekly on the whole shelled corn and alfalfa hay; DM percentages for the CCDS were reported as monthly averages derived from Galva Holstein Ag, the source of the CCDS. The pelleted supplement was assumed to be 91.3% DM and the DM of molasses was assumed to be 74.3% DM as provided in the 1996 NRC. Comparisons between treatment groups consist of average daily gain (ADG), feed to gain (F:G), quality grade (QG), yield grade (YG), and economic evaluations.

Table 1. Steer performance and carcass grades in the first trial.

	Treatment			
	Pasture	Pasture+ CCDS[1]	Feedlot	Feedlot+ CCDS
On test Wt (lb)	593	593	594	593
Off test Wt (lb)	1305	1267	1293	1326
Feed Intake, DM/d	23.23	25.18	20.48	21.72
ADG, lb/d	2.24	2.35	2.93	3.04
F:G, lb DM/lb gain	8.00	8.55	7.01	6.84
Quality Grade[2]	5.98(S+)	6.41(S+)	6.10(S+)	6.65(C-)
Yield Grade	2.11	2.30	2.63	2.20

[1]CCDS: condensed corn distillers solubles

[2]Quality grade: Prime^{+}= 12, Prime=11, Prime^{-}= 10, Choice^{+}= 9, Choice= 8, Choice^{-}=7, Select^{+}= 6, Select= 5 Select^{-}= 4, Standard^{+}= 3, Standard= 2, Standard^{-}= 1, Utility= 0

Table 2. Steer performance and carcass grades in the second trial.

	Treatment				
	Pasture	Pasture+ CCDS[1]	Feedlot	Feedlot+ CCDS	Pasture Finish+ CCDS
On test Wt (lb)	598	598	598	599	598
Off test Wt (lb)	1339	1295	1305	1310	1275
Feed Intake, DM/d	26.13	24.88	22.99	22.38	23.45
ADG, lb/d	2.49	2.33	2.95	3.00	2.70
F:G, lb DM/lb gain	7.44	7.95	7.81	7.47	8.70
Quality Grade[2]	6.89(C-)	6.63(C-)	6.20(S+)	6.74(C-)	4.57(S)
Yield Grade	2.51	2.56	2.30	2.63	2.21

[1]CCDS: condensed corn distillers solubles

[2]Quality grade: Prime^{+}= 12, Prime=11, Prime^{-}= 10, Choice^{+}= 9, Choice= 8, Choice^{-}=7, Select^{+}= 6, Select= 5, Select^{-}= 4, Standard^{+}= 3, Standard= 2, Standard^{-}= 1, Utility= 0