

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

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Summary and Implications

Condensed, corn, distillers solubles provides an effective energy supplement for finishing cattle across a number of finishing systems.

Introduction

The use of condensed corn distillers solubles (CCDS) as a feed source for steers backgrounded on pasture as well as finished in the feedlot or finished in a pasture environment was explored. The goal of this study was to document the benefits, as well as the limitations, of feeding CCDS to feedlot and backgrounded steers.

Materials and Methods

Feeder calves from 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. Five treatments with four pens of seven steers per treatment were set up to evaluate diet and environmental influence on cattle performance. The diet treatments consisted of comparing the addition of moderate levels of condensed, corn, distillers solubles (CCDS) to the ration the environmental influence consisted of placing the incoming feeder calves directly into a feedlot or deferring them to pasture with the fifth treatment involving the direct placement on a feedlot ration but cattle left in a pasture environment. The treatments were thus as follows: Direct feedlot placement with no CCDS (F), direct feedlot placement with CCDS in ration (FCCDS), deferred to pasture and no CCDS (P), deferred to pasture with free choice CCDS (PCCDS) and pasture placement with feedlot CCDS ration (PF). Refer to Table 1 for information concerning the rations. Cattle started the trial in mid May. Cattle on the pasture backgrounding treatments were left on pasture until late summer or early fall when pasture forage was depleted. These cattle were then moved into the feedlot and finished on the control feedlot ration or the CCDS feedlot ration. The PF group remained on pasture the entire time receiving the feedlot CCDS ration with no hay, however did receive some hay supplementation during their final days on feed in the early winter since grazable forage was no longer available.

Over the two years the average beginning steer weights were 593 lb and 598 lb respectively; the average ending weights for these years were 1298 lb and 1305 lb. The feedlot flooring is solid cement and the feedlot offers shelter protection from northern exposure. Pasture conditions consist of two acre paddocks rotational grazed. All pastures were fertilized twice a year and consisted predominantly of smooth brome grass. All steers were implanted with Compudose and injected with Ivomec at the beginning of each trial and reimplanted with Revalor approximately 100 days prior to harvest. The two feedlot rations were isocaloric and isonitrogenous. 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), F:G, quality grade (QG), yield grade (YG), and economic evaluations. Concerning the economic comparison, the following formula of "Gross Income minus Cost" was used for generating net values of comparison. The cost component contained all the costs incurred by the pen, thus the influence of mortality was included. Note that interest was not calculated in this estimate.

Cost Items:

Yardage in feedlot = \$ 0.40 / hd/day
Yardage in pasture = \$ 0.20 / hd/day
Treatments or pulls = \$ 35.00 / incident
Ration (grass is not included)
*Control feedlot ration \$ 0.071 / lb dm
*CCDS feedlot ration \$ 0.0675 / lb dm
*Pasture feedlot ration \$ 0.0699 / lb dm
Calf cost = 1.25 / lb

Income Items:

Beef sale value = \$ 1.50 / lb
Choice-Select discount = \$ 10/cwt
Choice-Premium bonus = \$10/cwt
Yield Grade 4 discount = \$ 10/cwt

Results and Discussion

Tables 2 and 3 that follow illustrate the treatment effects. Table 2 deals primarily with the gross feedyard observations such as live weight gain, feed conversion, animal growth and days on feed. Note that the feed to weight gain conversion results excludes the forage component of pasture or feedlot ration forage. Table 3 deals primarily with carcass characteristics and feeding profitability. Using a F value of 0.05 as a point of significance the letters that accompany the average results in these tables indicate no significance if they are the same. A difference in letters though does indicate a difference in results from treatments. The bottom value on these tables indicates the minimum difference between means to be considered a significant treatment effect.

Applying the income-cost issue to the data in a manner to please all readers is somewhat impossible due to the volatility of all components involved. The values outlined above were used as a reference and could be changed to the reader's preference. The flat treatment charge for instance was applied to all issues where an animal (dead or alive) was given particular attention. Other than those steer

fatalities outlined in Table 2, treatments came about due to outbreaks of pinkeye. One note on this pinkeye problem, there appeared to be a larger problem in cattle supplemented with CCDS on pasture. Why this may be occurring could be due to the tendency for cattle to congregate in the area where the CCDS are provided. One other aspect that was given some attention was whether the backgrounding or CCDS treatments would cause a larger variability in finished weights within a pen of cattle. From this trial, there was no significant tendency for this to happen. This trial itself proved that the use of CCDS in feedlot rations or as a supplement for cattle while on pasture is an effective feedstuff that can maintain or improve growth rates, reduce feed energy costs and, if fed at the levels provided in this trial, cause no health problems in the cattle to which they are fed.

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Table 1. Rations.

Feedstuff	Control Feedlot Ration	CCDS Feedlot Ration
Corn (whole)	73.57%	53.16 %
Molasses	3.00%	
Alfalfa hay	18.00%	18.00%
Control Supplement	5.34%	
CCDS Supplement		3.84%
CCDS		25%
Dry Matter	85.38%	71.12%
Cr. Protein	13.00%	13.00%
NPN	1.96%	0.93%
Ne G	58.1 Mcal/cwt	58.7 Mcal/cwt
Fat	3.78%	5.36%
Calcium	0.90%	0.76%
Phosphorus	0.30%	0.37%
Sulfur	0.19%	0.27%

*Concentrations given on a 100% dry matter basis.

Table 2. Feedlot Performance.

Treatment	Mortality	Start Wt. -lbs	Finish Wt.-lbs	Fin.Wt . pen StDev	Fin. Hip Ht. -in	ADG feedlot - lbs	F:G less forage	Days on Farm	Days in Feedlot
F	1.8% a	577 a	1298 a	117 a	51.1 a	3.04 ab	5.80 a	237.5 a	237.5 a
FCCDS	0% a	577 a	1311 a	141 a	51.4 ab	3.09 b	5.41 a	237.5 a	237.5 a
P	1.8% a	577 a	1319 a	134 a	51.7 ab	3.43 c	4.42 b	299.5 b	153.5 b
PCCDS	3.6% a	577 a	1296 a	142 a	51.9 b	3.23 bc	4.56 b	292.5 c	146.5 c
PF	0% a	577 a	1282 a	137 a	51.7 ab	2.81 a	5.80 a	251.5 d	0 d
Prob.>F	0.45	1.0	0.08	0.57	<0.01	<0.01	<0.01	<0.01	<0.01
Sig. Diff.	11.6%	38	44	56	0.7	0.25	0.61	4.5	5.1

*Different letters indicate significant difference between treatments at 0.05 level.

**Feed to Gain is provided as total feed less forage divided by total finished weight sold – the effect of mortality is included and forage is removed to allow comparison between feedlot and pasture.

Table 3. Carcass & Profitability.

Treatment	Carcass Wt. -lbs	Ribeye Area – in ²	Fat – in.	Yield Grade	Quality Grade	Health Treatments	Ration \$/lb dm	Total Cost \$ per Head	Net Return \$ per Head
F	791 a	13.5 a	0.54 a	2.52 ab	6.69 a	5.4% a	0.0713	1191.56a	-28.00a
FCCDS	801 a	13.3 a	0.59 a	2.71 a	7.21 a	0.0% a	0.0675	1151.22ab	29.91ab
P	804 a	13.1 a	0.72 a	2.56 ab	6.99 a	12.6% ab	0.0713	1092.00bc	92.60b
PCCDS	799 a	13.2 a	0.72 a	2.47 ab	6.98 a	26.9% b	0.0675	1069.92bc	109.05b
PF	785 a	13.5 a	0.55 a	2.18 b	5.25 b	0.0% a	0.0699	1026.53c	93.03b
Prob.>F	0.60	0.70	0.63	0.02	<0.01	<0.01	-----	<0.01	<0.01
Sig. Diff.	41	1.10	0.59	0.47	1.03	1.34	-----	82.82	91.06

*Treatments – treatments per pen of 7

**Ration \$/lb DM is feedlot ration cost