Evaluating Corn Condensed Distillers Solubles
Concentration in Steam-Flaked Corn Finishing Diets on
Cattle Performance and Carcass Characteristics

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Summary

Performance and carcass characteristics were evaluated using five concentrations of corn condensed distillers solubles (CCDS) replacing steam-flaked corn (SFC) in feedlot finishing diets using crossbred steers. As CCDS replaced SFC at concentrations of 0, 9, 18, 27, or 36% of the diet DM, DMI decreased quadratically. Average daily gain increased quadratically with greatest gains observed at 27% CCDS inclusion. A quadratic improvement was observed in F:G with optimum concentrations similar to what was observed for ADG at 27% CCDS inclusion. These results suggest corn condensed distillers solubles can effectively be used to replace SFC in feedlot finishing diets while improving ADG and F:G.

Introduction

Byproducts from the dry-milling ethanol process can be used in cattle diets to replace corn. Wet distillers grains with solubles (WDGS) interacts with corn processing methods (2007 Nebraska Beef Cattle Report, pp. 33-35). When replacing corn with WDGS, there is a greater improvement in F:G when DRC diets are fed compared to SFC diets. However, with distillers solubles (CCDS), the same interaction has not been observed. In fact, including 30% CCDS in SFC-based diets improved F:G to a greater extent compared with DRC-based diets (2013 Nebraska Beef Cattle Report, pp. 51-52), but 30% was the maximum inclusion evaluated. Previous work has shown that up to 36% of the diet (DM basis) of CCDS can be fed with a 50:50 blend of DRC and HMC (DRC:HMC) while improving gain and feed efficiency (2012 Nebraska Beef Cattle Report, pp. 64-65). Therefore, the objective of this study was to determine if greater concentrations of CCDS could be fed in SFC-based diets without reducing performance.

Materials and Methods

Four hundred forty crossbred steers (initial BW = 878 ± 49 lb) were utilized in a feedlot finishing trial at the University of Nebraska–Lincoln Panhandle Research Feedlot near Scottsbluff, Neb. Cattle were limit-fed a diet at 2% BW consisting of 40% wet distillers grains with solubles, 30% alfalfa hay, 20% corn silage, and 10% wheat straw (DM basis) for five days prior to the start of the experiment. Two-day initial weights were recorded on day 0 and 1 and were averaged and used as the initial BW. The steers were blocked by BW into light, medium, and heavy BW blocks, stratified by BW and assigned randomly to one of five dietary treatments. There were 11 head per pen and eight replications per treatment. Dietary treatments included 0, 9, 18, 27, or 36% CCDS replacing SFC and urea (Table 1). The corn was flaked at a target density of 28 lb/bushel at a commercial feedlot (Panhandle Feeders, Morrill, Neb.).

The composition of the CCDS used in this trial (Colorado Agri Products, Bridgeport, Neb.) contained 24.3% DM, 16.0% CP, 20.1% Fat, and 0.41% S (DM basis). Soybean meal (SBM) and urea were added to the diets to meet or exceed MP requirements of the animal. All diets contained 16% corn silage, 3.5% SBM, and 4.0% pelleted supplement (DM basis).

Steers were implanted with Component T-200 (Elanco Animal Health) on day 1. Animals in the heavy BW block were harvested on day 89 and the medium/light BW blocks were harvested on day 104 (Cargill Meat Solutions, Fort Morgan, Colo.). Hot carcass weight and liver scores were recorded on the slaughter date. Fat thickness, LM area, and marbling score were recorded after a 48-hour chill. Final BW, ADG, and F:G were calculated using HCW adjusted to a common 63% dressing percentage.

Data were analyzed using the MIXED procedure of SAS (SAS Institute, Inc., Cary, N.C.) as a randomized block design. Pen was the experimental unit and block was treated as a random effect.

Results

Dry matter intake decreased quadratically (P = 0.02) as the concentration of CCDS increased in the diet (Table 2). Average daily gain increased quadratically (P < 0.01) as CCDS increased with greatest gains observed at 27% and slightly decreased at 36%. There was a quadratic improvement (P < 0.01) in F:G as CCDS concentration increased in the diet. Less feed was consumed per pound of gain from 0% CCDS up to the 27% CCDS diet, but F:G increased at 36% CCDS. Even though a small increase in F:G was observed for cattle fed 36% CCDS compared with the optimum at 27%, the F:G was improved compared with the control diet. Hot carcass weight increased quadratically (P < 0.01) as CCDS increased, also peaking at 27% CCDS. Marbling score and calculated YG increased quadratically (P = 0.08 and 0.06, respectively). Fat thickness and LM area also tended to increase quadratically (P = 0.13 and 0.07, respectively) as CCDS increased in the diet. There was a trend (P = 0.10) for an increasing linear response for dressing percentage as CCDS increased in the diet. These results were similar to
Carcass Characteristics
diets disagree with previous data evalu-
(2012 Nebraska Beef Cattle Report, pp. 64-65).
Beef Cattle Report
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increasing concentrations of WDGS in
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was 0.92% S (DM basis).
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previous data when CCDS was fed in
DRC:HMC based diets (2012 Nebraska
These data with CCDS in SFC-based
disagree with previous data evaluating SFC and
distillers grains. Previous
data with distillers grains suggest that
increasing concentrations of WDGS in
SFC-based diets slightly decreases ADG
and has no effect on F:G. However, in
HMC or DRC-based diets, ADG and
F:G are improved with WDGS (2007
Nebraska Beef Cattle Report, pp. 33-35).
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