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Effects of Wet Distillers Grains Finishing Diets on Fat Content and Marbling Score in Steers

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Summary

Ninety-four, calf-fed, crossbred steers were randomly allocated to three finishing diets consisting of different amounts of wet distillers grains plus solubles (0%, 15% or 30%, DM basis). Steers were fed for 133 days to test the relationship between marbling score and fat content, as well as effects on marbling texture and marbling distribution. Results of this research suggest that feeding up to 30% of wet distillers grains plus solubles has no detrimental effects on marbling in beef.

Introduction

Marbling is an important factor in determining the USDA quality grade of beef. It is also considered a visual indicator of palatability. It has been proposed that feeding wet distillers grains plus solubles

(WDGS) alters the relationship between intramuscular fat and marbling score such that cattle fed WDGS receive lower marbling score (and USDA quality grade) at similar intramuscular fat content to cattle finished on corn. Feeding grains leads to more production of propionate leading to glucose conversion and marbling deposition. On the other hand, a high level of fiber from forage diets leads acetate production and external fat deposition (subcutaneous fat). During ethanol production starch in corn is converted to ethanol. Ethanol co-products such as distillers grains have lower levels of starch which could lead to lower glucose and thereby lower marbling. Most of the research on WDGS conducted by the University of Nebraska shows a neutral or positive on increase marbling score. Vander Pol et al. (2007 *Nebraska Beef Report*, pp. 39-42) demonstrated that feeding WDGS lowered acetate and elevated propionate. Therefore, we hypothesize that WDGS do not alter marbling in beef.

Procedure

Ninety-four calf-fed, crossbred steers were assigned to three different finishing diets (0%, 15% or 30% WDGS, DM basis). At 48 hours postmortem, marbling score, marbling texture and marbling distribution were assessed by a USDA grading supervisor. After grading, a quarter-inch thick ribeye slice (*M. Longissimus thoracis*) was excised from each carcass at the 12th/13th rib interface and transferred under refrigeration to the Loeffel Meat Laboratory at the University of Nebraska–Lincoln. The ribeye slices were trimmed, submerged in liquid N, pulverized and stored at -112°F. Total lipid was determined by ether extraction

Results

There were linear relationships between marbling score and fat percentage in the ribeye (Figure 1). The coefficients of determination were 21%, 33% and 40% for 0%,

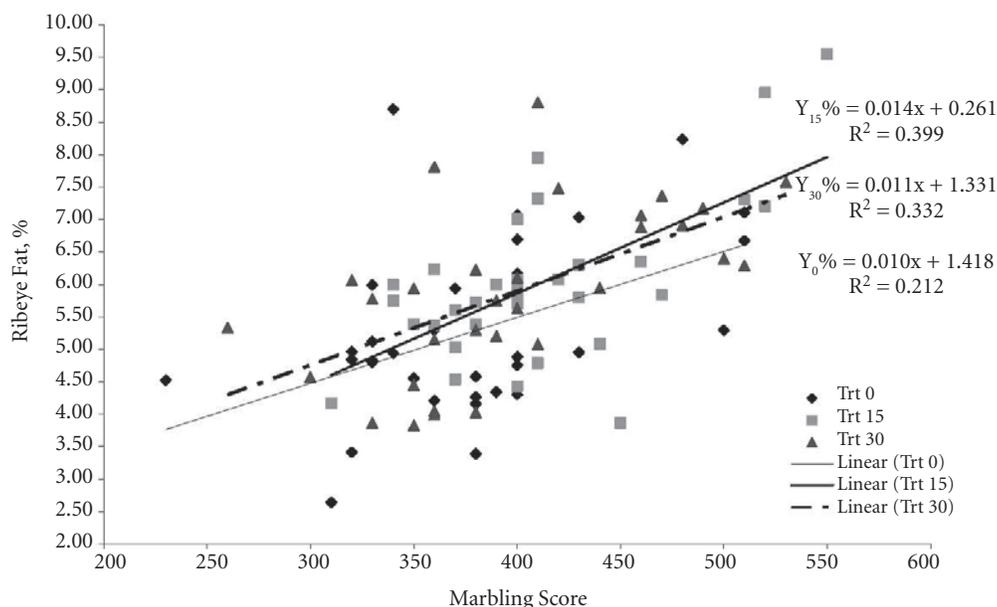


Figure 1. Relation between fat% and marbling score for all treatments.

Table 1. WDGS diets effects on quality attributes.

Attributes	Dietary treatments ^a			P-value
	0	15%	30%	
Marbling score ^b	393	403	404	0.46
Marbling texture ^c	1.60	1.58	1.52	0.84
Marbling distribution ^d	1.29	1.15	1.22	0.40
Fat, %	5.44	5.91	5.94	0.19

^aWet distillers grains plus solubles.

^bSlight = 300 - 399, Small = 400 - 499.

^cFine = 1, Medium = 2, Course = 3.

^dEven = 1, Uneven = 2.

15%, and 30%, respectively. Slopes were statistically similar ($P = 0.72$) indicating an equal rate of change

between marbling score and fat content among all treatments. Feeding 15% or 30% WDGS did not

significantly influence marbling score, marbling distribution, marbling texture or fat content when compared to 0% WDGS (Table 1). Thus, there appears to be no detrimental effects on fat and marbling from feeding WDGS to cattle.

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