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## Addition of urea to finishing cattle diets containing steam-flaked corn and wet corn gluten feed

### Abstract

Three hundred thirty-nine crossbred beef heifers were used in a 74-day finishing study to evaluate effects of adding 0.5% urea to finishing diets containing steam-flaked corn and 34% (dry basis) Sweet Bran® wet corn gluten feed (WCGF). Diets were fed once daily ad libitum. Urea addition tended ( $P<0.06$ ) to increase finishing average daily gain, to improve ( $P<0.12$ ) feed efficiency, and to increase ( $P<0.06$ ) fat thickness. Heifers fed urea had a lower percentage ( $P<0.03$ ) of carcasses grading USDA Choice. This study suggests that finishing diets containing a combination of steam-flaked corn and WCGF may benefit from addition of urea as a source of supplemental ruminally available nitrogen.

### Keywords

Cattlemen's Day, 2001; Kansas Agricultural Experiment Station contribution; no. 01-318-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 873; Beef; Wet corn gluten feed; Urea; Finishing

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## ADDITION OF UREA TO FINISHING CATTLE DIETS CONTAINING STEAM-FLAKED CORN AND WET CORN GLUTEN FEED

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### Summary

Three hundred thirty-nine crossbred beef heifers were used in a 74-day finishing study to evaluate effects of adding 0.5% urea to finishing diets containing steam-flaked corn and 34% (dry basis) *Sweet Bran*<sup>®</sup> wet corn gluten feed (WCGF). Diets were fed once daily *ad libitum*. Urea addition tended ( $P < 0.06$ ) to increase finishing average daily gain, to improve ( $P < 0.12$ ) feed efficiency, and to increase ( $P < 0.06$ ) fat thickness. Heifers fed urea had a lower percentage ( $P < 0.03$ ) of carcasses grading USDA Choice. This study suggests that finishing diets containing a combination of steam-flaked corn and WCGF may benefit from addition of urea as a source of supplemental ruminally available nitrogen.

(Key Words: Wet Corn Gluten Feed, Urea, Finishing.)

### Introduction

Cattle consuming corn-based finishing diets normally require supplemental ruminally available nitrogen sources such as urea or soybean meal to optimize ruminal starch fermentation. Because WCGF contains a degradable intake protein fraction similar to that of soybean meal, our objective was to determine if adding urea to diets containing WCGF would result in further performance improvements.

### Experimental Procedures

Three hundred thirty-nine beef heifers averaging 804 lb were used in a randomized complete block design experiment. Heifers were blocked by previous nutritional regimen, and treatments were randomly assigned to pens containing four to seven heifers per pen, with 27 pens per treatment. Treatments (Table 1) consisted of steam-flaked corn finishing diets containing 34% *Sweet Bran* WCGF with or without 0.5% urea (dry matter basis). Diets were fed once daily *ad libitum* for 74 days, and then heifers were slaughtered and carcass data were obtained.

### Results and Discussion

Performance data was shown in Table 2. Average daily gains ( $P < 0.06$ ) and feed efficiencies ( $P < 0.12$ ) tended to be improved with urea supplementation. Backfat thickness also tended ( $P < 0.06$ ) to be increased with urea supplementation. In spite of the tendency for increased 12<sup>th</sup> rib fat, the percentage of carcasses grading USDA Choice or Prime was greater for cattle fed no urea. We conclude that steam-flaked corn finishing diets containing 34% WCGF (dry matter basis) may benefit from the addition of a ruminally available nitrogen source such as urea.

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<sup>1</sup>Cargill Corn Milling, Blair, NE.

**Table 1. Experimental Diets**

Ingredients	Treatments	
	No Urea	Urea
	----- % of Dry Matter -----	
Steam-flaked corn	55.8	55.3
Alfalfa hay	6.0	6.0
Wet corn gluten feed	33.8	33.8
Tallow	2.1	2.1
Urea	-	0.5
Limestone	1.6	1.6
Sodium chloride	0.3	0.3
Potassium chloride	0.3	0.3
Vitamin/trace mineral premix <sup>a</sup>	0.1	0.1
Crude protein, analyzed	14.9	16.1
	----- Per Head Daily <sup>b</sup> -----	
Rumensin <sup>®</sup>	300 mg	300 mg
Tylang	90 mg	90 mg
Melengestrol acetate	0.5 mg	0.5 mg

<sup>a</sup>Vitamin/trace mineral premix formulated to provide (total diet dry matter): 1,200 IU/lb vitamin A, 0.1 ppm cobalt, 20 ppm copper, 0.5 ppm iodine, 50 ppm manganese, 0.2 ppm selenium, and 50 ppm zinc. <sup>b</sup>Rumensin/Tylan/Melengestrol Acetate supplement fed at 0.44 lb per head per day (dry matter basis).

**Table 2. Effects of Urea on Performance and Carcass Characteristics**

Item	Treatment		SEM	P-value
	Control	Urea		
No. of heifers	167	172		
Initial weight, lb	806	802	6.4	0.71
Final weight, lb <sup>a</sup>	1058	1066	8.4	0.52
Dry matter intake, lb/day	20.3	20.6	0.20	0.28
Average daily gain, lb	3.41	3.56	0.05	0.06
Feed:gain	5.95	5.78	0.07	0.12
Hot carcass weight, lb	670	676	5.3	0.52
Dressing percentage <sup>b</sup>	60.8	60.9	0.2	0.68
Ribeye area, in <sup>2</sup>	12.5	12.5	0.14	0.93
Fat thickness, in	0.40	0.44	0.01	0.12
Kidney, pelvic & heart fat, %	2.2	2.2	0.03	0.15
Liver abscesses, %	3.6	2.3	1.3	0.52
Yield grade 1, %	13	11	2.5	0.54
Yield grade 2, %	40	40	3.8	0.96
Yield grade 3, %	42	43	3.8	0.83
Yield grade 4 & 5, %	5	6	2.4	0.50
Marbling score <sup>c</sup>	Sm <sup>22</sup>	Sm <sup>14</sup>	7.5	0.45
USDA Prime, %	3	4	1.2	0.57
USDA Choice, %	64	51	3.7	0.03
USDA Select, %	31	40	3.7	0.10
USDA Standard, %	1	4	1.1	0.15
Dark cutters, %	1	1	0.8	0.92

<sup>a</sup>Final weight = hot carcass weight ÷ common dressed yield of 63.36%. <sup>b</sup>Dressing percent = hot carcass weight ÷ live weight before shrink. <sup>c</sup>Sm = Small.