

Feeding Corn Gluten for Dairy Cows: Wet Corn Gluten Versus Wet Distillers Grains

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What differences in milk yield and percents of solids nonfat, fat and milk urea nitrogen (MUN) might occur in two different diets for dairy cattle?

The above question was answered in a study trial when one diet included wet corn gluten or wet distillers grains. The remaining ingredients were kept as constant as possible to investigate the overall efficiency and any differences between wet corn gluten and distillers grains.

The trial was conducted at Henn House Dairy in Norfolk, Neb. Two pens of first-calf heifers were fed two diets and two pens of cows fed two diets. To keep the groups as uniform as possible, the heifers were randomized for age and stage of lactation, and the older animals were randomly assigned to lots based on lactation number and stage of lactation.

Material and Methods

One hundred and sixteen lactating Holstein multiparous cows and 94 first lactation heifers were divided into two groups and fed diets containing either wet distillers grains or wet corn gluten for 12 weeks (May 28 to Aug. 19, 2004). The groupings were based on the stage of cow lactation depending on their days in milk within the lactation. The cows were fed the rations for an adaptation period of one week before the start of the actual data collection. Table I shows the number of cows and heifers and the average days in milk and milk yield for each group.

Milk yield was recorded daily and the average milk production per week calculated for each cow. Milk components (fat percentage, protein percentage, MUN and solids non fat (SNF)) were recorded once every two weeks (six times) for each individual cow.

Table II lists the ration components for the two treatment groups as fed on a dry matter basis.

Table II. Experimental rations as percentage of dry matter

Rations	Wet corn gluten DM	Wet distillers DM
Wheat Straw	0.79	0.82
Alfalfa	19.31	19.30
Corn Silage	23.78	30.70
Cotton Seed	6.86	—
Corn (Fine Ground)	14.22	18.37
Corn Gluten, wet	19.92	3.09
Corn Distillers Grains	—	17.62
Corn Gluten Meal	1.26	—
Corn Distillers Dry	1.68	—
Porcine Meat & Bone	0.61	—
Soyplus	0.47	0.47
Blood Meal	0.32	0.25
Soybean Meal	5.25	4.18
Energy Booster	0.68	0.68
25 % Fat/Molasses blend	2.05	1.18
Urea	0.11	0.39
Sodium Bicarb	0.86	0.91
Mineral and Vit	1.47	1.68
Salt	0.35	0.35

Table I. Averages and standard deviations of days in milk (DIM), milk yield in pounds and number of cows and heifers fed rations with either distillers grains or wet corn gluten

Ration	Cows			Heifers		
	DIM	Milk yield	Number	DIM	Milk yield	Number
Distillers grains	138.00 ± 66.04	92.42 ± 43.65	61	95.53 ± 61.64	78.97 ± 26.76	43
Wet corn gluten	147.42 ± 77.21	90.56 ± 43.91	55	104.73 ± 72.80	75.84 ± 24.43	51

An analysis also was conducted of the Nutrient Content Dry Matter basis of the wet corn gluten and the distillers grains as contained in the diet. The analysis is presented in Table III. The major difference in the two rations is in the crude protein, which was .20 in the wet corn gluten diet and .66 in the wet distillers grains diet.

Table III. Nutrient content (DM basis) of the wet corn gluten and wet distillers grains based rations

Nutrient	Wet corn gluten	Distillers grains
DM, %	100.00	100.00
CP, % DM	17.97	18.05
UIP/CP, % DM	36.34	38.58
SIP/CP, % DM	34.28	31.39
CP-NPN, % DM	0.20	0.66
Forage, %	43.9	50.80
ADF, % DM	17.69	17.17
NDF, % DM	31.85	29.60
For NDF, % DM	17.07	19.90
NFC, % DM	36.58	39.43
TDN, % DM	73.63	73.85
NEI Mcal / lb	0.80	0.79
NEg Mcal /lb	0.01	0.01
Fat, % DM	5.66	5.66
Ca, % DM	0.92	0.91
Phos, % DM	0.43	0.42
Mg, % DM	0.36	0.36
K, % DM	1.45	1.38
S, % DM	0.27	0.25
Na, % DM	0.52	0.51
Cl, % DM	0.36	0.38
Salt, % DM	0.39	0.37
Vit A, IU/day	170196	170192
Vit D, IU/day	42549	42549
Vit E, IU/day	852.0	854.0

Results

The major reason for this research was to see if any differences were expressed in the milk yield of the two diets.

The analysis of heifers fed the two diets and the analyses of cows fed the two diets showed no statistical differences in any yield traits. These results lead to the conclusion that as far as the yield traits of milk, fat percentage, protein percentage, lactose percentage, SNF percentage and MUN showed no differences. Therefore, the effect of feeding wet distillers grains or wet corn gluten did not show any statistical differences.

Figures 1, 2, 3, 4 and 5 show the averages for daily milk yield, fat percentage, protein percentage, SNF and MUN for cows and heifers fed the two rations. In this analysis, heifers fed the two diets were combined, as well as the two cow diets were combined. No significant difference occurred in response between the heifers or cows fed the two diets for milk yield, fat percentage, protein percentage, SNF or MUN. These figures lead to the conclusion that no significant differences in response exist in heifers or cows fed the two diets. Therefore, feeding wet distillers grains or wet corn gluten had no effect on the yield traits.

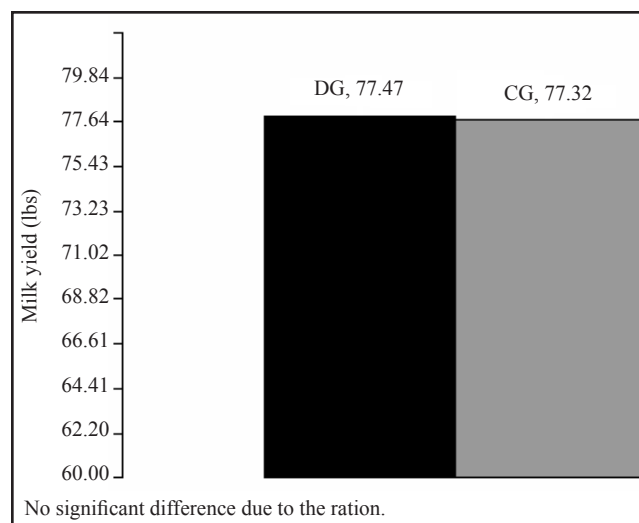


Figure 1. Averages of daily milk yield (lbs) for cows and heifers fed rations with either wet distillers grains (DG) or wet corn gluten (CG).

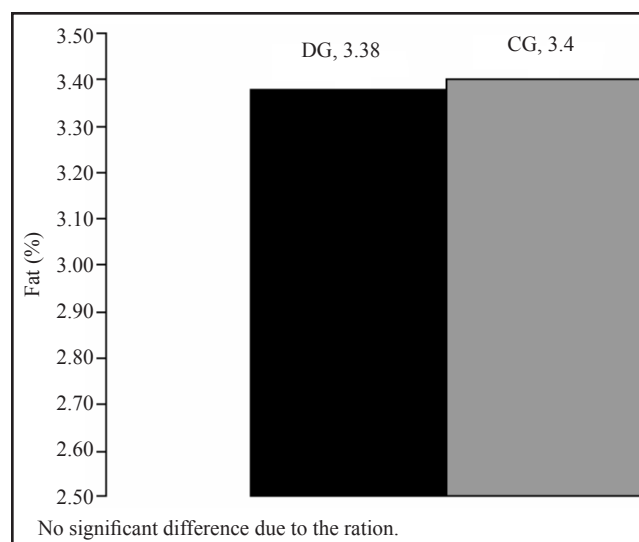


Figure 2. Averages of fat (%) for cows and heifer fed rations with either wet distillers grains (DG) or wet corn gluten (CG).

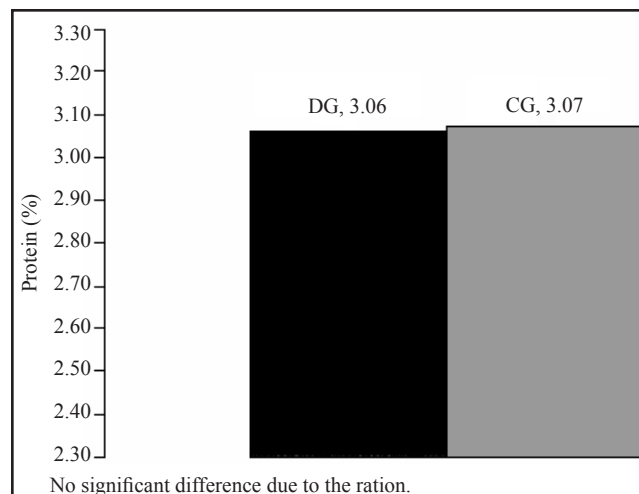


Figure 3. Averages of protein (%) for cows and heifer fed rations with either wet distillers grains (DG) or wet corn gluten (CG).

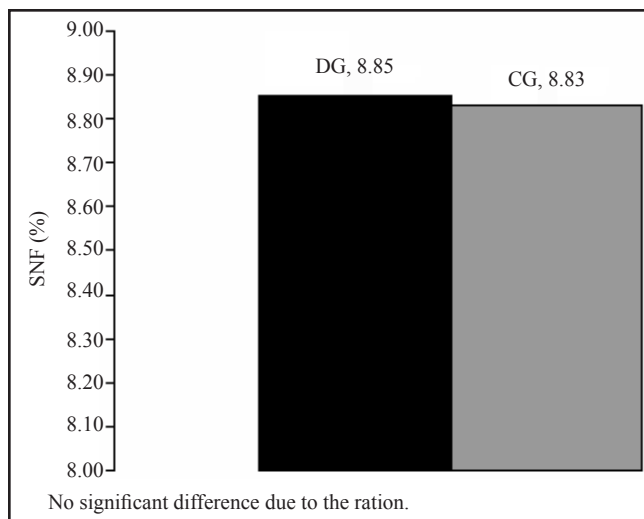


Figure 4. Averages of solid non fat (SNF) (%) for cows and heifer fed rations with either wet distillers grains (DG) or wet corn gluten (CG).

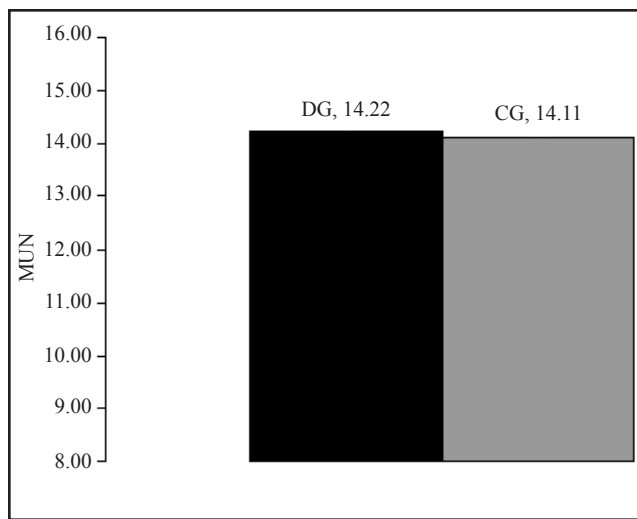


Figure 5. Averages of milk urea nitrogen (MUN) for cows and heifer fed rations with either wet distillers grains (DG) or wet corn gluten (CG).

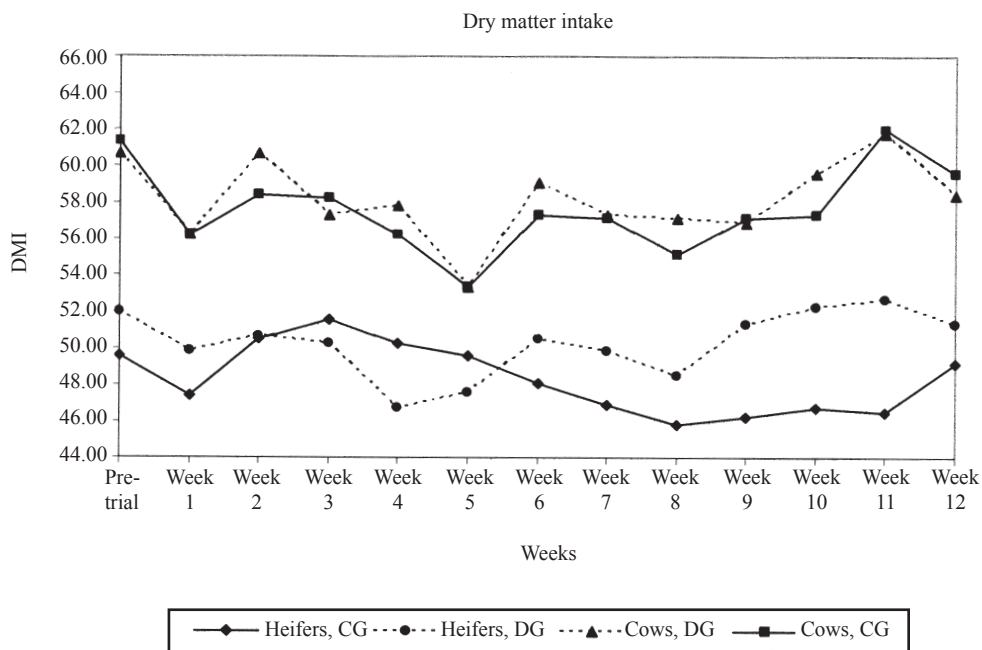


Figure 6. Average dry matter intake (DMI) (lbs/day) for cows and heifer fed rations with either wet distillers grains (DG) or wet corn gluten (CG).

Another factor to consider was the average dry matter intake (DMI) for cows and heifers fed these rations. Figure 6 shows the DMI for the two groups of heifers and cows. There was a slight decline in weeks five and eight but this can be attributed to extremely hot and humid weather. The important point to recognize is that both groups declined in a similar manner during this period.

Diet seems to have no effect on DMI of neither cows nor heifers. Cows had greater feed intake than heifers.

Conclusions

- Milk yield, fat percentage, protein percentage, SNF and MUN showed no significant differences between feeding wet distillers grains or wet corn gluten.
- No significant difference occurred between the heifer groups or cow groups in any yield traits.
- Even during hot summer weather, no significant difference occurred in the component traits or in DMI.
- A dairy producer has the option of using either product with no significant difference in the component or milk yield traits.

- This research gives dairy producers the additional option to shop around for the best price and use wet distillers grains or wet corn gluten in the ration.

Acknowledgments

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