Feeding High Oil Corn to Lactating Dairy Cows

T.R. Dhiman, B. Hoogendijk, R.P. Walgenbach and L.D. Satter

Introduction

Fats and oils are used in diets of high producing dairy cows to increase energy density. Use of feed ingredients that are normally high in oil can be a less expensive way to add fat to the diet than by adding tallow. High oil corn could be one of these sources. The objective of this study was to quantify the effect of additional fat supplied by high oil corn compared with normal corn on dairy cow performance.

Materials and Methods

Fifty-three dairy cows (31 multiparous and 22 primiparous cows) were assigned randomly before calving to normal corn (NC) and high oil corn (HOC) treatments. A pretrial diet was fed during the first two wks of lactation. Starting at wk 3 and lasting through wk 24 of lactation, cows were fed diets containing either normal high moisture ear corn and corn silage (NC) or high oil high moisture ear corn and corn silage (HOC). High oil corn (mixture of Hybrid-5501 and 4401; Cenex Land O'Lakes) and a control variety of comparable maturity (Hybrid LOL-522; Cenex Land O'Lakes) were used as high moisture ear corn. High oil corn (Hybrid 671 EDPP) and control corn (Dekalb DK-512) of comparable maturity were used as corn silage. Both types of corn were grown at the US Dairy Forage Research Center Farm Facility, Prairie du Sac, WI during 1994 for use in this experiment. Chemical composition of diet ingredients is in Table 1. Ingredient composition of diets is in Table 2. Daily feed intake and milk yield were recorded. Weekly milk samples were analyzed for composition. Cows were weighed weekly.

Results

Cows fed diets containing normal or high oil corn had similar feed intake (Table 3). Milk yield, milk fat and lactose contents were unaffected by the corn treatments. Milk protein contents were slightly lower with the high oil corn treatment. Cows fed normal or high oil corn had similar body weight gain.

Summary

The high oil corn hybrids used in this study to supply both corn grain and corn silage did not improve lactation performance of dairy cows.

Table 1. Chemical composition of diet ingredients.

Item	DM %	CP	NDF	ADF	Fatty acids[1]
			% DM basis		
Alfalfa silage	37.3	20.9	43.0	34.6	1.74
Normal corn silage	36.6	7.2	42.4	24.0	2.12
High oil corn silage	36.8	7.9	40.4	23.4	3.02
Normal high moisture ear corn	69.0	8.8	13.3	3.05	3.96
High oil high moisture ear corn	75.0	8.9	13.8	2.90	6.32

[1]Sum of C14:0 to C18:3.

Table 2. Ingredient composition of diets and chemical composition of total diet.

		Treatment	
Ingredient	Pretrial	NC	HOC
Alfalfa silage	15.5	27.5	27.5
Chopped alfalfa hay	12.0	-	-
Control corn silage	11.25	22.5	-
High oil corn silage	11.25	-	22.5
Control high moisture ear corn	15.75	31.5	-
High oil high moisture ear corn	15.75	-	31.5
Soybean meal	10.0	10.0	10.0
Roasted soybeans	4.6	4.6	4.6
Blood meal	2.0	2.0	2.0
Sodium bicarbonate	.2	.2	.2
Dicalcium phosphate	1.0	1.0	1.0
Trace-mineralized salt	.7	.7	.7
Vitamin ADE[1]	trace	trace	trace
Total mixed ration DM, %	54.6	49.6	50.6
NE , Mcal / kg DM	1.671	1.657	1.685
CP, % DM	18.8	19.1	19.3
Fatty acids[2], % DM	3.91	3.43	4.38

[1]Vitamin A, 148,500; Vitamin D, 49,500; and Vitamin E, 495 IU/d per cow.
[2]Sum of C14:0 to C18:3.

Table 3. Lactation performance.

	Treatment			
Measurement	NC	HOC	SEM	*P*
Feed intake, kg/d	21.7	21.6	.4	.6
Milk yield, kg/d	36.5	36.0	.8	.7
3.5% FCM, kg/d	35.4	34.8	.7	.6
Milk fat, %	3.39	3.28	.05	.14
Milk protein, %	3.00	2.93	.03	.1
Milk fat yield, kg/d	1.22	1.18	.03	.4
Milk protein yield, kg/d	1.07	1.07	.02	.9
Lactose, %	4.95	4.91	.03	.4
FCM / kg feed intake	1.63	1.67	.02	.2
Body weight (BW), kg				
Beginning (BW at wk 2)	577	558		
End (BW at wk 23)	607	586		
Gain (End BW minus beginning)	29.7	28.0		