Sources of Forage Adjusted to Temperature Changes for Wintering Cows in Drylot

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Summary

Cows in mid-to-late gestation gained weight when fed either milo stover silage or alfalfa hay-wheat straw but lost weight when the forage source was milo-stover bales. When supplemented with additional corn grain as temperature decreased, cows receiving milo stover silage or alfalfa hay-wheat straw gained more weight, and cows receiving milo stover bales lost less weight than cows receiving the same forages but fed to NRC (1976) requirements.

Introduction

To more accurately formulate maintenance rations, we need to evaluate nutritive values of forages used to winter beef cows.

Cows in mid-to-late gestation are normally managed for slight to modest gains. Estimated gains, based on NRC requirements, and actual gains vary because of cold temperatures. It is important to have data to indicate how energy intake should be varied as temperature varies to insure that cows reach desired weights.

Experimental Procedure

Ninety mature cows (Simmental x Hereford and Hereford) in mid-to-late gestation were allotted by weight, condition score, breed, and calving date to six treatments: (1) dry harvested milo stover, (2) dry harvested milo stover plus additional energy during cold stress, (3) milo stover silage, (4) milo stover silage plus additional energy during cold stress, (5) 33% alfalfa hay and 67% wheat straw, and (6) 33% alfalfa hay and 67% wheat straw plus additional energy during cold stress.

The 61-day trial began December 2, 1976, and ended February 1, 1977. Cows in all treatments were fed to gain 0.5 to 0.75 lb. per day, as determined by NRC (1976) requirements for their weights and stages of gestation.

Additional energy for maintenance during cold stress (treatments 2, 4, and 6) was supplied by corn grain fed when effective (wind-chill) temperature dropped below the cow's critical temperature (when she must produce additional heat to maintain internal temperature). Effective temperature was determined daily with a 7 a.m. dry-bulb temperature reading and average wind speed the previous 24 hours. Critical temperature was estimated to be -1.11 C (30 F). An additional 1.8% of recommended NRC (1976) energy intake was added for each 1 C (1.8 F) below critical

temperature (see page 97).

No protein supplement was used but all cows had access to a 50% dicalcium phosphate, 50% salt mixture.

Results and Discussion

Analyses of forages fed and weight response of the cows are listed in tables 8.1 and 8.2 . With energy treatments pooled in each forage group, cows fed milo stover silage or alfalfa hay-wheat straw gained more weight ($P<.05$) than cows fed dry harvested milo stover. Cows fed additional energy during cold stress gained more weight ($P<.05$) than cows fed to NRC (1976) requirements.

Milo stover silage or alfalfa hay-wheat straw are suitable forages for cows in mid-to-late gestation. Either intake of dry harvested milo stover must be increased or additional supplementation with protein and/or energy must be provided if cow weight gains are to equal those of cows on the other forages.

Corn was fed to cows whose rations were adjusted for cold stress 43 of the 61 days of this trial. Total corn intake was 31 lbs. per cow. Energy-adjusted cows gained 24 pounds more than the NRC-fed cows or 0.4 lb. more per day. Condition of cows at the start of the winter feeding period could make the additional weight gain critical for satisfactory calving, nursing, and re-breeding.

Table 8.1 . Analyses of forages fed in cold-stress feeding trial.

	Dry matter %	Crude protein	Crude fiber	Ether extract	Ash	Acid detergent fiber	Protein insoluble in hot water	Ca	Phos.
	% dry matter basis								
Dry harvested milo stover	75.0	5.1	33.1	1.4	15.4	56.5	3.1	.37	.14
Milo stover silage	38.0	8.0	25.1	2.2	9.4	38.2	5.0	.39	.25
33% alfalfa + 67% wheat straw[1]	90.0	8.3	37.4	1.8	9.3	49.5	4.8	.60	.17

[1]Calculated from separate analysis of alfalfa and wheat straw.

Table 8.2. Performance of pregnant cows on NRC rations and NRC rations adjusted for cold stress.

Forage and energy treatments	No. cows	Initial wt., lbs.	Forage dry matter intake, lbs.	Wt. change lbs.
Dry harvested milo stover				
NRC	15	1099	23.4[1]	-69
Adjusted energy	15	1083	20.9[1]	-50
Milo stover silage				
NRC	15	1128	17.4	13
Adjusted energy	15	1154	17.4	33
Alfalfa hay-wheat straw				
NRC	15	1156	17.4	21
Adjusted energy	15	1125	17.4	47
Treatments pooled				
Dry harvested milo stover	30	1091	22.2[1]	-60[b]
Milo stover silage	30	1141	17.4	23[a]
Alfalfa hay-wheat straw	30	1140	17.4	34[a]
Energy sources pooled				
NRC	45	1128	19.4	-13[b]
Adjusted energy	45	1121	18.6	11[a]

[a,b]Weights within a group with different superscripts differ significantly ($P<.05$).

[1]For dry harvested milo stover disappearance is assumed as intake (waste estimated at 15%).