Wheat Head Silage and Corn Silage for Growing Steers[1]

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Summary

Two trials were conducted to evaluate two varieties of wheat head silage (Parker and Blue Boy) and whole-plant corn silage in growing rations for steers.

Each silage was fed to 21 steers for 122 days. All steers were full-fed a 12.5% crude protein ration containing 86% silage and 14% supplement. Steers fed corn silage gained faster, consumed more dry matter and were more efficient than steers fed either wheat head silage ration. Gain and feed consumption were greater for steers fed Blue Boy than for those fed Parker. Ration dry matter digestibility was higher for the corn silage ration than for either wheat head silage ration.

Introduction

Wheat at present prices is not competitive as a feed grain with corn or milo, but in recent years its prices were competitive with other feed grains. Practical experiences of cattle feeders, as well as research data, indicate nutritional problems associated with high levels of wheat in beef rations. An alternative to feeding wheat as grain would be to harvest all or a portion of the wheat plant as silage. Two non-nutritional advantages would be: (1) early harvesting to reduce field losses and to allow double cropping and (2) providing a late-spring silage to use silo capacity more efficiently.

The objective of this trial was to determine relative feeding values of wheat head silage and corn silage in growing rations for beef cattle.

Experimental Procedure

The two wheat varieties used were Parker (an awned, hard, red winter wheat) and Blue Boy (an awnless, soft, red winter wheat). Head silage was made from the upper one-half of the plants of each variety in the mid-to late dough stage of plant maturity. Harvest date, dry matter, and yield for the head silages are shown in table 9.1. The forage harvester was equipped with a two-inch, recutter screen. Water was added to the head material to increase moisture content six to seven percentage units. Approximately

[1]Equipment for harvesting wheat head silage was provided by Field Queen Corporation (a division of Hesston Corporation), Maize, Kansas.

45 tons of each wheat silage were ensiled in concrete stave silos (10 ft. X 50 ft.). Irrigated corn with an estimated grain yield of 125 bu. per acre was harvested as silage and stored in 12 ft. X 60 ft. concrete stave silos.

Trial 1. Sixty-three Angus yearling steers averaging 513 lb. were used in a 122-day growing trial (October 6, 1972 to February 5, 1973). Three pens of seven steers each were randomly assigned to one of the three silages. Ration composition (dry matter basis) was 86% of the appropriate silage and 14% supplement (table 9.2). Supplement A was fed in the corn silage ration and supplement B in the two wheat head silage rations. All rations were formulated to contain 12.5% crude protein and each was mixed and fed twice daily. All steers were wormed and implanted with 36 mg. stilbestrol before the trial started. Steers were fed in 15 X 30 ft. non-sheltered, concrete pens. Twelve-hour shrunk weights were taken at the beginning and end of the trial; 28-day intermediate weights were taken before the a.m. feeding.

Trial 2. Six steers weighing 572 lb. were used in a digestion trial. Two steers received each of the silage rations described in trial 1 during a 10-day preliminary (ration adjustment period) and six-day total fecal collection period.

Results and Discussion

Chemical analyses of the silages are shown in table 9.3. Crude protein was highest in the two wheat head silages; ash and crude fiber were lowest in the corn silage. Acid content was similar for corn and Blue Boy silages; lactate tended to be lower and acetate and butyrate higher in Parker than in either of the other silages.

Results of the two trials are shown in table 9.4. Steers fed the corn silage ration gained faster ($P<.05$), consumed more ration dry matter ($P<.05$) and required less feed per lb. of gain ($P<.05$) than steers fed either of the two wheat head silage rations. Average daily gain and feed consumption were greater ($P<.05$) for steers fed Blue Boy head silage than for those fed Parker head silage. Dry matter digestibility tended to be higher for the corn silage ration than for either wheat head silage ration.

Table 9.1 Wheat Head Silage Harvest Information

Variety	Harvest date	% Dry matter at harvest	Tons of 60% moisture silage/acre	Grain yield, bu./acre
Parker head	June 8,9,10	42.7	7.8	39.0
Blue Boy head	June 11,12	42.6	6.2	38.0

Table 9.2 Composition of Supplements Fed in Silage Growth and Digestion Trials

Ingredient	Supplement A	Supplement B
	% (dry matter basis)	%
Soybean meal	87.60	---
Milo, rolled	6.72	91.44
Dicalcium phosphate	1.28	1.61
Limestone	0.58	3.12
Salt	2.14	2.14
Fat	1.00	1.00
Trace minerals	0.36	0.36
Aureomycin[a]	0.25	0.25
Vitamin A[b]	+	+
Composition (DM basis)		
Crude protein, %	43.50	9.43

[a]Formulated to supply 70 mg per steer per day.

[b]Formulated to supply 30,000 I.U. per steer per day.

Table 9.3 Analyses (100% Dry Matter Basis) of Indicated Silages

Item	Silage		
	Whole-plant corn	Blue Boy head	Parker head
Dry matter, %	33.4	35.7	36.6
Crude protein, %	8.7	13.6	13.2
Crude fiber, %	22.5	23.8	23.7
Ash, %	6.5	8.9	9.1
pH	4.22	4.31	4.30
% Lactate	2.6	2.6	1.9
% Acetate	1.5	1.6	1.8
% Butyrate	0.3	0.4	0.6

Table 9.4 Steer Performance and Ration Digestibility

Item	Silage		
	Whole-plant corn	Blue Boy head	Parker head
No. of steers	21	21	20[a]
Initial wt., lb.	518	514	516
Final wt., lb.	751	700	690
Avg. daily gain, lb.	1.92[b]	1.53[c]	1.41[d]
Avg. daily feed, lb.[e]			
silage	13.33	12.41	11.51
supplement	2.16	2.02	1.89
Total	15.49[b]	14.43[c]	13.40[d]
Feed/lb. gain, lb.	8.09[b]	9.49[c]	9.48[c]
DM digestibility, %[f]	70.1	66.9	66.7

[a]One steer removed as he refused to consume the ration.

[b,c,d]Means on the same line with different superscripts differ significantly ($P<.05$).

[e]100% dry matter basis.

[f]Each value is the mean for two steers.