

HAY AND SILAGE AS RATIONS FOR GROWING STEERS DURING PASTURE SHORTAGES

S.A. SPIKER*, F.J. MICKAN* and G.W. THOMAS*

Summary

Hay and silage were fed ad libitum to two groups of ten-month old Friesian type steers. during the periods of summer and winter pasture shortage as sole rations in a feedlot. In the feedlot liveweight gains were greater for the hay fed steers. When returned to pasture, the steers previously fed silage gained more live weight than the steers previously fed hay. At 22 months of age there was no significant difference in liveweight, carcass weight or carcass characteristics between the two groups of steers

I. INTRODUCTION

Pasture conserved as either hay or silage is often fed to cattle during periods of pasture shortage or used during periods of deferment of grazing.

Several experiments have indicated that mature cattle can make sufficient gains on hay or silage alone (Kerr, Brown and Morrison 1961; Bishop and Kentish 1970). However with young cattle (less than 250 kg live weight) hay usually gives greater gains than silage, due mainly to the inability of young cattle to consume sufficient silage (Forbes and Irwin 1968, 1970; Forbes and Jackson 1971).

Bailey and Bishop (1973) concluded that steers previously fed hay in a feedlot lost the ability to graze efficiently, which resulted in poor liveweight gains on return to pasture. However the effect of feeding silage in a feedlot on subsequent ability to graze has not been examined.

This experiment compared the effect of hay and silage fed in a feedlot, on the growth rate of young steers both in the feedlot and when returned to pasture.

II. MATERIALS AND METHODS

(a) Animals

Thirty ten-month old Friesian type steers were ranked on live weight and allocated to two groups, a hay group and a silage group, so that the mean starting weight (168 kg) was the same.

(b) Fodders

Silage was conserved from a perennial pasture consisting of perennial ryegrass (Lolium perenne), cocksfoot (Dactylis glomerata), white clover (Trifolium repens) and subterranean

* Department of Agriculture, Victoria
Ellinbank Dairy Research Station, Warragul, 3820

clover (*Trifolium subterraneum*). The pasture was cut with a flail type forager in early November and stacked immediately in a double wedge stack. The stack was rolled continuously throughout the harvesting period and for six hours the day after cutting finished.

Hay was made in mid-December from a similar pasture.

The silage and hay were sampled for dry matter determination and chemical analysis using a 2.5 cm x 40 cm core sampler. The silage stack was sampled from several levels as feeding progressed and every bale of hay was sampled.

When dried to constant weight at 100°C. the hay had 85 per cent-dry matter and the silage 22 percent crude protein percentage of the hay was 8.6 and that of the silage 10.6; crude fibre percentage of the hay was 28.5 and that of the silage 30.8, based on 65°C. dry weight. The silage had a pH of 4.0.

(c) Management

The experiment was conducted from February 21, 1973 to January 22, 1974. The steers spent two periods in the feedlot and two at pasture (Table 1). When moving in and out of the feedlot non-fasted and 24 hour fasted starting and finishing live weights were measured. Intermediate non-fasted live weights were also measured every two weeks.

The steers were fed hay or silage, depending on their treatment group, twice daily when in the feedlot to maintain ad libitum availability of feed. Each load of silage and bale of hay was weighed into the feeders, the residue being weighed out twice weekly.

Throughout the pasture stages of the experiment the steers were stocked at 4.9/ha on perennial pasture about 18-20 cm high. Ad libitum amounts of pasture were made available to the steers by strip grazing to allow for maximum liveweight gain.

(d) Carcass Evaluation

Measurements made at slaughter were cold carcass weight, carcass length, eye muscle area and fat cover at the 10th-11th rib dissection and dressing percentage calculated from final liveweight and cold carcass weight.

III. RESULTS

Mean daily intake of hay dry matter in stage one (6.72kg) was significantly greater ($P < 0.05$) than that of silage dry matter (5.56 kg), but not in stage three (7.19kg v. 6.62 kg).

During the feedlot stages liveweight gains of the silage group were lower than those of the hay group, but when returned to pasture, liveweight gains of the silage group were greater than those of the hay group (Table 1). These differences were greater during the first two weeks of a new feeding regime (Table 1).

The steers previously fed hay showed a reduced rate of liveweight gain on first being returned to pasture, while in contrast the steers previously fed silage showed an increased rate of liveweight gain.

TABLE 1.

Daily liveweight gain of the steers during each feedlot and pasture stage.

FEED STAGE	Weeks	Liveweight Gain kg/steer/day					
		Non-fasted weights			Fasted weights		
		Hay	Silage	L.S.D.	Hay	Silage	L.S.D.
1. Feedlot	1-2	0.73*	0.22	.18)			
	3-8	0.52*	0.27	.10)	.47*	.21	.07
2. Pasture	9-10	0.04	0.94*	.20)			
	11-18	0.68	0.72	.11)	.57	.79*	.08
3. Feedlot	19-20	2.00*	1.06	.39)			
		0.53*-0.13		.19)	.83*	.27	.13
4. Pasture	25-26	-0.80	1.16*	.34)			
		0.93	1.05*	.07)	.73	.96*	.07

* Significantly greater than the alternative group $P=0.05$

Final fasted live weights of the steers were not significantly different (mean 388 kg), nor were the carcass weights (mean 281 kg) or other carcass parameters measured ($P>0.05$).

IV. DISCUSSION

Despite the higher crude protein percentage of the silage and possibly its high digestibility due to earlier date of harvesting, liveweight gains in the feedlot were greater for the steers being fed hay than for those being fed silage. The results are consistent with the result of other workers (Forbes and Irwin 1968; 1970; Forbes and Jackson 1971)

The comparatively poor performance of the steers previously fed hay on being returned to pasture is in agreement with the observations by Bailey and Bishop (1973). Their explanation of this phenomenon in terms of loss of grazing efficiency during the period in the feedlot was not supported by our experiment. Here the steers previously fed silage, also in the feedlot, exhibited an improvement in apparent liveweight gain when returned to pasture. Part of this difference between the two groups of steers could be explained by difference in gut fill of animals on different rations. However there appears to remain a real difference in rate of liveweight gain as shown by the continued superior performance of the steers previously fed silage, even after the first two weeks of adjustment at pasture, and by the superior rate of fasted liveweight gains.

This superior performance of the silage fed group on pasture is difficult to explain. As no measurements of pasture intake or actual digestibility of the pasture by the

experimental animals were made, no definite reasons can be given. Rate of passage of ingesta and adjustment of rumen micro-flora after changes in diet may have more effect in steers fed hay than in those fed silage. Intake of pasture by steers previously fed silage may be greater than for hay fed steers. The observed differences in growth rate could also be explained in terms of compensatory gain, as the final liveweights and carcass weights were not significantly different.

As the final carcass weights and quality were the same for steers fed either hay or silage, convenience and economics should determine which type of feed to use.

V. ACKNOWLEDGEMENTS

We thank the staff of Ellinbank Dairy Research Station for assistance with the experiment and final preparation of the manuscript and Mr. R. Jardine, Biometrician, Department of Agriculture, Victoria, for analysis of data.

VI. REFERENCES

- ALDER, F.E., McLEOD, D.St.L., and GIBBS, B.C. (1969). Journal of the British Grasslands Society 24:199
- BAILEY, P.J., and BISHOP, A.H. (1973). Australian Journal of Experimental Agriculture and Animal Husbandry 13:621
- BISHOP, A.H., and KENTISH, T.D. (1970). Australian Society of Animal Production 8:493
- FORBES T.J., and IRWIN, J.H.D. (1968). Journal of the British Grasslands Society 23:299
- FORBES, T.J., and IRWIN, J.H.D. (1970). Journal of the British Grasslands Society 25:96
- FORBES, T.J., and JACKSON, N. (1971). Journal of the British Grasslands Society 26:257
- KERRN J.A.M., BROWN, W.O., and MORRISON, J. (1961). Animal Production 3:321.