

FEED INTAKE BY FEEDLOT CATTLE: INFLUENCE OF BREED AND SEX

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Story in Brief

Records from a large commercial feedlot were analyzed to determine the feed intake and health differences attributable to sex and breed type. Feed intakes adjusted for differences in live weight averaged 10 percent greater for Holstein steers than beef steers but intake of beef heifers was equal to that of beef steers. Incidence of bullers and death losses was greater for Holstein than beef steers though a seasonal effect on incidence of bullers and on death losses was apparent. These peaked during midwinter and were lowest during midsummer suggesting that day length may be involved.

(Key words: Sex, Feedlot, Feed intake, Animal health.)

Introduction

Cattle fed in feedlot of the Great Plains vary in type and sex with economic conditions. Certain types are more desirable at specific cattle prices. Greater feed intakes are usually expected for steers than heifers and for Holstein than beef-bred steers (Plegge et al., 1984; Fox and Black, 1984). However, effects of sex and breed on feed intake with various times on feed and on incidence of riding (bullers), hospitalizations and death losses have not been reported. The objective of this report was to determine the influence of breed type and sex on feedlot performance and health.

Materials and Methods

The feedlot conditions and records screened in this report have been described in a companion paper (Owens et al., 1985). Records included information from 745 different sets of cattle (3 sets of cattle per pen during the year) of which 22 were for Holstein steers, 48 were non-dairy heifers and 675 were non-dairy steers of British, British crossbred and (a limited number) Brahman crossbred cattle. Most cattle were yearlings or long yearlings when placed on feed and were fed for 98 to 168 days. Intakes for the year represented values from a total of 132,393 cattle. A mean of 18 observations were available per pen for a total of 4316 period-pen observations. Data from pens with less than 50 cattle were removed prior to analysis. Further information on the sets of cattle are presented in table 1.

Data available for each set of cattle included starting feedlot weight (weight on arrival into the feedyard typically after trucking at least 24 hours), sex, breed, number of cattle in the pen, number in the hospital pen for all reasons, deaths per pen for all reasons, number of

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animals removed due to riding by other animals (bullers), and projected current weight. This weight was calculated and updated daily based on initial weight, feed intake and calculated energy contents (net energy for maintenance and gain) of the diet. No information on origin, length of haul or backgrounding of cattle was available.

For statistical analysis, the dry matter intake, percent bullers, hospitalized and dead were classed for means comparison by sex (beef heifers vs beef steers) and breed (Holstein steers vs beef steers), by initial weight and by days on feed.

Results and Discussion

In Table 1, feed intakes for steers and heifers are presented for various lengths of time on feed. Holstein steers ate more feed than beef steers (25.1 vs 21.4 pounds of dry matter per day) with a mean difference of 3.7 pounds or 17% during each period.

TABLE 1. General information on cattle subdivided by type.

Variable	Beef steers		Beef heifer		Holstein steer	
	Mean	SD	Mean	SD	Mean	SD
Pens	675		48		22	
Cattle/pen	175	81	104	51	101	33
Total cattle	119,482		5012		2056	
Pen-period records	3897		289		130	
Weights						
Initial	687	80	622	61	757	78
112 days	1029	79	916	68	1136	78
ADG	2.97		2.63		3.35	
Bullers, %	2.8	2.7	.1	.4	3.6	3.7
Hospital, %	1.4	3.0	1.3	2.2	1.3	1.8
Dead, %	.7	1.2	.6	1.1	1.2	1.6
Dry matter intake						
across all pens of cattle						
0-14 days	17.4	3.0	17.1	2.3	22.2	2.7
15-28 days	21.8	2.7	21.5	2.2	25.7	2.1
29-42 days	21.9	2.1	21.3	1.7	25.0	1.5
43-56 days	22.1	2.1	21.6	2.2	25.7	1.7
57-70 days	22.3	2.1	21.8	2.2	26.0	1.4
81-84 days	22.4	2.1	21.6	2.4	26.0	1.6
85-98 days	22.4	2.1	21.4	1.8	25.7	1.5
99-112 days	21.9	1.9	21.4	1.7	25.0	1.1
113-126 days	20.9	1.6	20.2	.9	24.1	1.1
129-140 days	19.7	1.6	18.8	1.5	22.8	1.7

The difference was largest from 14 to 28 days on feed which was near the peak feed intake for the all cattle (Figure 1). During the first two to three weeks, diets were increased in concentrate level. For beef steers and heifers, dry matter intake was almost constant from 14 days to 112 days on feed. For dairy steers, daily intake tended to decline after 98 days on feed. Despite large differences in intake between pens of cattle, feed intake within each pen was surprisingly

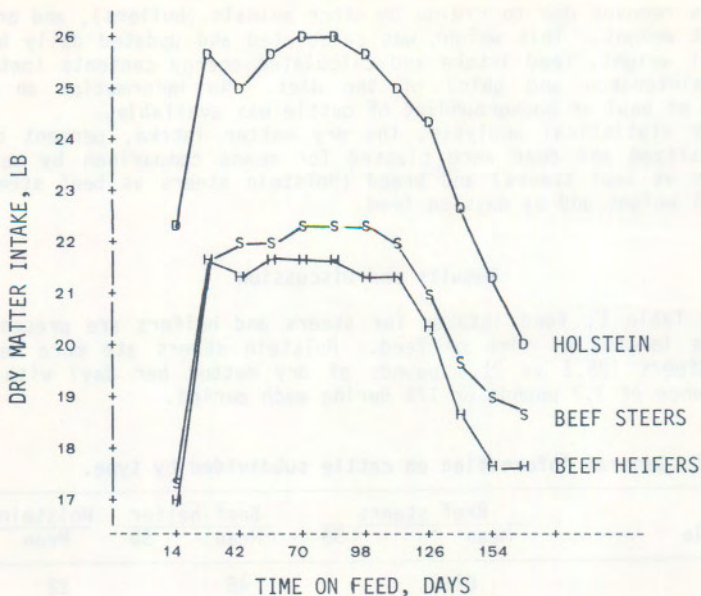


Figure 1. Influence of time on feed on feed intake of feedlot cattle.

constant, usually varying by no more than .5 pounds of dry matter per head from one 14-day period to the next. Feed intake of a subsequent period could be predicted reasonably well ($r = .80$) by feed intake the previous period. Hence, intakes did not fluctuate and compensate over time, but pens with high intakes remained high.

Overall, feed intake of beef steers exceeded feed intake of heifers by 2.8 percent (21.4 vs 20.8 lb). Feed intake for heifers tended to peak at 28 days and decline thereafter while with beef and Holstein steers, intake peaked after about 70 days on feed. The decline was steeper for Holstein than beef steers or heifers. The time point at which intake declined tended to be earlier (fewer feeding days) for heifers than for steers.

These differences in feed intake due to sex and breed may be associated with differences in weight of cattle initially and during the feeding period even though most equations estimating feed intake do not include initial weight as a variable. Starting weights were much higher for Holstein than beef steers, and higher for steers than heifers during all months of feeding (Figure 2). Note that few Holstein steers were fed during the summer months. As feed intake is greater for Holstein steers than beef steers, a seasonal effect on feed intake would be expected in this feedlot due to the prevalence of Holstein steers on feed during certain seasons. Adjusting for this difference in weight during the feeding period might pull feed intake estimates for breeds and sexes together.

Intakes at various weights during the feeding period are presented in Figure 3. Feed intake by heifers and steers were very similar when compared at a similar live weight. Since mature weight of steers should exceed that of heifers, the similar feed intake of the two

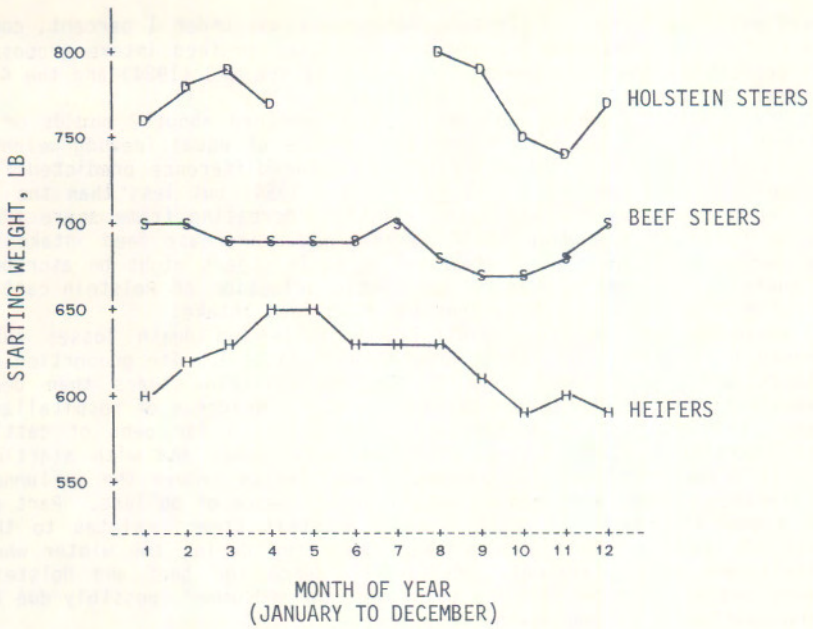


Figure 2. Influence of season on starting weights.

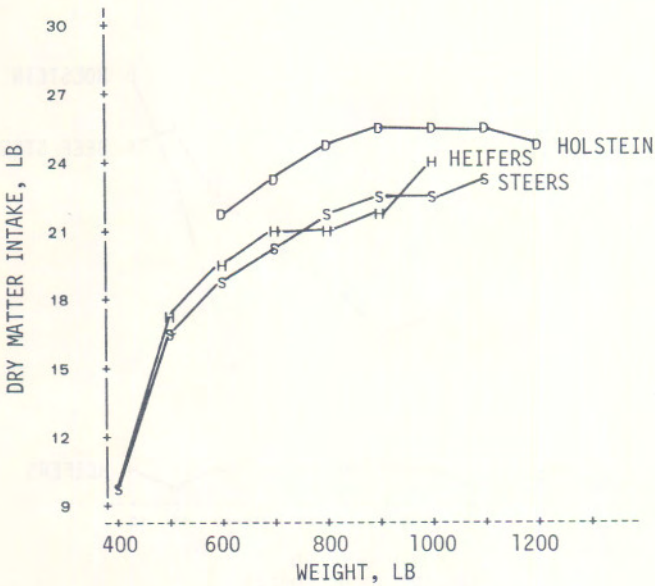


Figure 3. Influence of weight on feed intake.

sexes was surprising. Difference due to sex was under 1 percent, considerably less than the 3.3 percent reduction in feed intake proposed for heifers of the same weight as steers by the NRC (1984) and the 4.7 percent calculated by Plegge et al. (1984).

Dry matter intake by Holstein steers remained about 2 pounds or 9 percent above that of beef steers and heifers of equal feeding weight. This difference is slightly greater than the difference predicted for Holsteins of 8.2 percent by Plegge et al. (1984) but less than the 17 percent proposed by Fox and Black (1984). Increasing frame score from medium to large according to NRC (1984) would increase feed intake by 5.6 percent. Higher feed intake of Holstein steers might be ascribed to their larger mature size or to genetic selection of Holstein cattle for high milk production and, thereby, high feed intake.

Incidence of bullers, hospitalized cattle and death losses subdivided by breeding and sex is presented in Table 1. The proportion of bullers and death losses were higher for Holstein steers than beef steers with little difference between types in incidence of hospitalization. This is plotted across months in Figure 4 for pens of cattle with starting weights between 900 and 1000 pounds and with starting weights between 650 and 750 pounds. These limits remove the influence of starting weight and feedlot weight on incidence of bullers. Part of the higher incidence of bullers with Holstein steers relates to the month of feeding. Most dairy steers were fed during the winter when bullers are more prevalent. Buller incidence for beef and Holstein steers peaked in midwinter and was lowest in midsummer, possibly due to a photoperiod effect on sex hormone levels.

Death losses also tended to be highest during the fall, especially for steers, and lowest during the summer. This is plotted in Figure 5 for the same pens of cattle as used above. No explanation for this

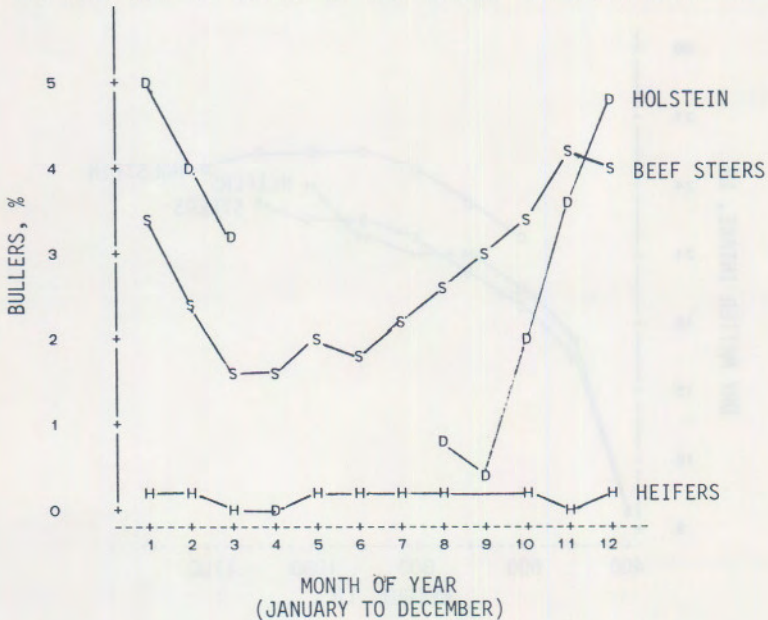


Figure 4. Influence of season on incidence of bullers.

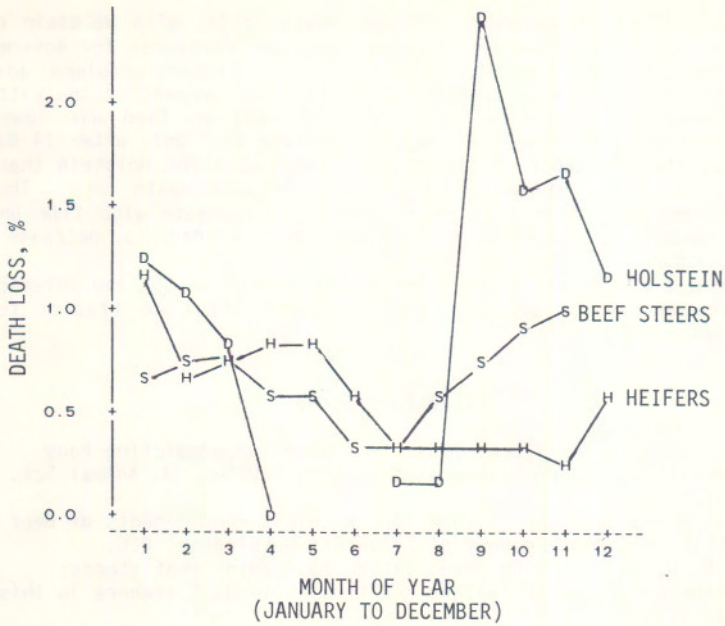


Figure 5. Influence of season on death loss.

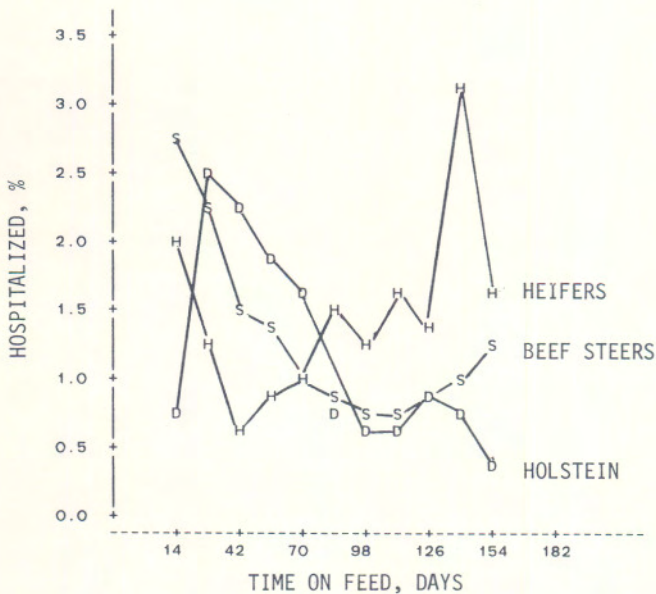


Figure 6. Influence of time on feed on percentage of cattle in hospital pens.

seasonal effect is apparent. Higher death losses with Holstein cattle might be due to the longer trucking times and distances for movement to the Great Plains area for feeding or to greater problems adapting Holsteins to high concentrate diets. Yet, the percent of the cattle in a pen hospitalized during the first 14 days on feed was lower for Holstein than beef steers or heifers (Figure 6). Only after 14 days on feed was the incidence of hospitalization higher for Holstein than beef steers. This corresponds to the time of greater death loss. The percent of heifers in hospital pens tended to increase with time on feed while numbers of steers in hospital pens tended to decrease with feeding time.

These differences in feed intake and animal health and interactions with season due to sex and breed can be useful to predict feedlot performance and profits.

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