IMPACT OF LIVER FLUKES ON THE PERFORMANCE OF FEEDLOT STEERS

R.B. Hicks[1], D.R. Gill[2], F.N. Owens[2], C.A. Strasia[3], L.J. Perino[4], M.T. Smith[1] and H.G. Dolezal[5]

Story in Brief

In a recent feeding trial, 101 out of 317 steers were found at slaughter to have liver flukes. Steers with liver flukes gained 5.9% slower than steers without flukes over a 135 day feeding period (3.39 vs 3.19 lb/day). Regression equations to predict daily gain, dry matter intake and feed efficiency utilizing initial weight and incidence of flukes (% of steers/pen with flukes) as input factors were developed. For each 10% increase in incidence of flukes, daily gain decreased by .028 lb/day and dry matter intake decreased by .151 lb/day. However, feed efficiency was not altered by the presence of flukes.

(Key Words: Feedlot, Steers, Liver Flukes.)

Introduction

Liver flukes are being detected at slaughter in a sizeable number of feedlot cattle fed in high plains feedlots. In a private study done for the Hitch Feedlots in 1984 and 1985, 1,045 of 31,817 head had evidence of fluke infection present at slaughter (3.28%). The incidence in different lots ranged from 0 to 34%. In a recent Oklahoma experiment, flukes were detected in 26 out of 140 head (Hicks et al., 1987). Steers with flukes gained 8.8% slower than steers without flukes over a 119 day period in this experiment. Australian workers (Chick et al., 1980) reported that gains were reduced by 14.4% in grazing steers artificially injected with flukes. This paper on liver flukes resulted from the detection of flukes in 32% of the cattle in a feeding trial. With this proportion of cattle harboring flukes, it was possible to statistically analyze the effect of liver flukes on the performance of feedlot steers.

---

[1]Graduate Student [2]Regents Professor [3]Area Livestock Specialist
[4]Research Associate [5]Assistant Professor

Materials and Methods

Liver flukes were discovered at slaughter in 101 of 317 feedlot steers used in the evaluation of virginiamycin. Because of individual identification, it was possible to analyze for effects of flukes. Livers were examined for abscesses and presence of liver flukes at slaughter and carcass data obtained 24 hours postmortem. The data was analyzed using a general linear model with treatment, fluke, and weight replicate as main effects.

Results and Discussion

The presence of liver flukes reduced daily gains during all phases of the feeding period (Table 1). This contrasts with the results of the previous study (Hicks et al., 1987) in which steers with flukes appeared to make compensatory gains during the last 28 days on feed. On a carcass adjusted basis, daily gains were reduced by 5.9% ($P<.001$) in steers with flukes (3.39 vs 3.19 lb).

Mean carcass weight was 19 lb lower ($P<.001$) in steers with flukes (Table 2) as would be expected due to the reduction in gain. Ribeye area

Table 1. Effect of liver flukes on steer performance.

	Absence	Presence
Number of steers	216	101
Weight, lb*		
Starting	690	690
56 days	935[b]	917[a]
Daily gains, lb*		
0-28	3.80[d]	3.46[c]
29-56	3.44[d]	3.19[c]
57-84	3.12[f]	2.96[e]
85-112	2.95[d]	2.77[c]
113-slaughter	2.48[d]	2.18[c]
0-56	3.63[b]	3.32[a]
57-slaughter	2.95[b]	2.75[a]
0-slaughter, live	3.21[b]	2.97[a]
0-slaughter, carcass[g]	3.39[b]	3.19[c]

*Expressed as least square means.
[a,b]Means with different superscripts differ ($P<.001$).
[c,d]Means with different superscripts differ ($P<.05$).
[e,f]Means with different superscripts differ ($P<.10$).
[g]Based on carcass weight divided by .6332, actual mean dressing percent.

Table 2. Effect of liver flukes on carcass parameters.*

	Absence	Presence
Carcass wt, lb	736[b]	717[a]
Dressing %	63.2[c]	63.5[d]
Rib eye area, sq in	12.23[d]	11.99[c]
KHP, %	1.94	1.97
Fat thickness, in	.55	.53
Marbling score	435	452
Percent choice	69.3	76.9
Yield grade	3.25	3.25
Percent YG 4	15.7	11.1

*All values expressed as least square means.
[a,b]Means with different superscripts differ (P<.001).
[c,d]Means with different superscripts differ (P<.10).

was also reduced (P<.10) in steers with flukes (11.23 vs 11.99 sq in). However, steers with flukes tended to have a greater degree of marbling (P=.104) with more carcasses grading choice (76.9 vs 69.3%, P=.17). Similar trends were noted in the previous trial (Hicks et al., 1987).

These data show that the presence of liver flukes can severely reduce performance of feedlot cattle. However, there are no data available on the effect of flukes on feed efficiency. In this experiment, the incidence of steers with flukes in each of the 40 pens ranged from 0 to 75%. Thus it was possible to develop regression equations to predict daily gain, dry matter intake and feed efficiency utilizing initial weight and incidence of flukes as input factors. As expected, pen daily gains were reduced as incidence of flukes increased (P<.05). For each 10% increase in incidence of flukes, daily gain decreased by .028 lb/day. DM intake also decreased as incidence of flukes increased (P<.05). For each 10% increase in incidence of flukes, DM intake decreased by .151 lb/day. However, feed efficiency was not altered by the presence of flukes.

In Table 3, predicted daily gain, DM intake and feed efficiency for steers initially weighing 690 lb with different incidences of steers with flukes (0 to 100%) are shown. Returns per head are also shown. The following assumptions were made in calculating returns: purchase cost of $81/cwt; fed 135 days; feed cost of $124/ton DM; yardage fee and feed mark-up of 35 cents/day and selling price of $70/cwt. Predicted gains for 0 and 100% incidence of flukes/pen steers (3.41 and 3.13 lb/day) agree well with observed gains for steers without and with flukes (3.41 and 3.15 lb/day). It would appear that fluke infection reduces returns by about $14/head.

In summary, flukes reduce DM intake causing a reduction in gains without altering feed efficiency.

Table 3. Effect of level of infection on performance.

Incidence of flukes per pen, %	Daily gain, lb[a]	DM intake, lb[b]	Feed/ gain[c]	Return per head, $
0	3.41	19.49	5.70	36.36
12.5	3.38	19.31	5.70	34.62
25	3.34	19.12	5.71	32.89
37.5	3.31	18.93	5.71	31.15
50	3.27	18.74	5.72	29.42
62.5	3.24	18.55	5.72	27.68
75	3.20	18.36	5.72	25.95
87.5	3.17	18.18	5.73	24.21
100	3.13	17.99	5.73	22.48

[a]Predicted by model (R^2=.71).
[b]Predicted by model (R^2=.89).
[c]Calculated from DM intake and daily gain.

Literature Cited

Chick, B.F. et al.. 1980. Production effects of liver fluke (Fasciola hepatica) infection in beef cattle. Aust. Vet. J. 56:588.

Hicks, R.B. et al.. 1987. The effect of liver flukes on the performance of feedlot steers. Okla. Agr. Exp. Sta. Res. Rep. MP-119:337.

Smith, M.T. et al. 1989. The effect of virginiamycin on performance of feedlot cattle. Okla. Agr. Exp. Sta. Res. Rep. MP-127:137.