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Impact of Health on Profitability of Feedlot Steers

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Story in Brief

The economic impact of respiratory disease during a 150-day finishing period on net return of 204 steer calves was evaluated. Net return from feeding steers was calculated using average feeder steer prices from 1985 to 1995, carcass premium and discount averages from 1995 and 1996, and a feed cost of $165/ton DM. Feed efficiency was assumed to be equal for all cattle. Health was classified at harvest by a lung lesion scoring system. Net return for steers without lung lesions was $20.03 more than for steers with lung lesions but non-active lymph nodes. Medicine costs alone accounted for 25% of this reduction in net return for steers with lung lesions but without lymph node activity with the remaining 75% due to decreased carcass value (9.4% more U.S. Standard carcasses and 3.9% less carcass weight). Compared with steers without lung lesions, steers with lesions plus active lymph nodes had $73.78 less net return of which 21% was due to medicine costs and 79% due to lower carcass weight (8.4% less) and lower quality grade (24.7% more U.S. Standard carcasses). Overall, respiratory morbidity was very detrimental to net profit of feedlot steers.

(Key Words: Health, Morbidity, Net Return.)

Introduction

For years, cattlemen have recognized the importance of calf health and its relationship to profitability. Respiratory complications account for over 90% of all clinical treatments during the first four to five weeks at the feedyard (Martin and Lumsden, 1987) and may continue throughout the finishing phase (Edwards, 1988; Martin et al., 1982). Consequently, bovine respiratory disease (BRD) is the most costly disease among feedlot cattle throughout North America.

Although the medical costs attributable to the treatment of BRD are substantial, the impact of BRD on performance may be even more costly. Production losses, including reductions in both live and carcass weights and less desirable feed efficiencies, have been associated with BRD. Results from the Texas A&M Ranch-to-Rail program (McNeill et al., 1996) revealed that "healthy" steers realized more profit than "unhealthy" steers when health was diagnosed clinically. The current study was conducted to determine the economic impact of respiratory disease on net profit of feedlot steers.

Materials and Methods

Respiratory tracts were evaluated at harvest using a lung lesion scoring system and an evaluation of the activity of the bronchial lymph nodes. This health index is much more discerning diagnostically than visual or fever appraisal and more highly correlated with ADG of steers. Details of the animals, production measurements, respiratory tract evaluation procedures, and carcass characteristics are discussed in a companion paper (Gardner et al., 1998).

Value Determination. Initial value of each feeder steer was calculated using initial feedlot weight and the average 10-yr price for various steer weight classes from 1985 to 1995 (Table 1). Feedlot cost included a ration cost of $165/ton DM and a daily yardage fee of $.05/head. Because effects of health status on feed intake were not measured, we assumed that, because sick cattle gained slower, they ate less feed than healthy cattle. Consequently, in the present study, we conservatively assumed that feed efficiency of each sick animal was equal to that of the mean of all cattle. A base carcass value of $105.00/cwt for low Choice, yield grade 3.0 carcasses was used with average premium and discount prices for the years of 1995 and 1996 (Table 2) to simulate a pricing grid. In the event that a carcass qualified for more than one discount, only the largest discount was applied. Net return accounted for both actual and

opportunity costs using a 9% interest rate.

Differences in carcass value from the base price ($105.00/cwt) were partitioned by calculating the percentage of total carcass weight that received a discount for unacceptable quality grade, yield grade, or carcass weight for each lung lesion classification group.

***Statistical Analysis*.** The data set consisted of 204 cattle fed in a single pen for which complete health and carcass data were collected. Data were analyzed for differences in net return using least squares procedures (SAS, 1985). Upon obtaining a significant F value, least squares means were used to separate treatment means with probability values generated by SAS (1985). Also, data were analyzed to determine which of the discount factors accounted for differences in net return.

Results and Discussion

Performance and carcass traits of steers as well as initial cattle investment, feedlot expenditures, and gross carcass value are shown in Tables 3 and 4. Total calf cost was higher for calves that had lung lesions plus active lymph nodes at harvest because they happened to be heavier when they entered the feedlot. Because feed efficiency was assumed to be constant, regardless of health status, those calves that had higher daily gains had a higher feed cost. However, if calves that experienced a health complication during the finishing period were not as efficient as their healthy counterparts (McNeill et al., 1996), true net return for steers with higher ADG would be greater than presented in Table 4. The impact of current and past health status on feed efficiency needs further research attention in view of the potential to reduce morbidity through mass medication programs.

Net return for steers that did not have lung lesions at harvest averaged $20.03 more than for those that had lung lesions but non-active lymph nodes. This difference in net return can be partitioned into greater medicine cost (25%) with the remainder due to decreased carcass quality and weight (Figure 1). Steers with lung lesions as well as active lymph nodes had a $73.78 less net return than cattle with healthy lungs. Medicine accounted for 21% of this difference with the remaining 79% being due to decreased carcass weight (8.4% lower) and quality grade (24.7% more U.S. Standard carcass).

Implications

Respiratory morbidity is very detrimental to net profit from feeding steers. Because carryover effects of pneumonia on performance are large, consequences of respiratory disease are costly. Any strategies that can reduce lung lesions should reduce medical expenditures and improve carcass weight and quality.

Literature Cited

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Table 1. Feeder steer prices for years 1986 to 1995.	
Weight class, lb	Cost, $/cwt
< 500	96.53
500 to 599	88.19
600 to 699	82.42
700 to 799	79.11
> 799	75.27

Table 2. Carcass premiums and discounts stratified by quality grade, yield grade, and carcass weight.		
Trait	**Premium, $/cwt**	**Discount, $/cwt**
Quality Grade		
Prime	5.00	--
Premium Choice	2.00	--
Low Choice	0.00	0.00
Select	--	7.00
Standard	--	15.00
Yield Grade		
1	3.00	--
2	2.00	--
3	0.00	0.00
4	--	12.00
Carcass Weight		
< 500	--	35.00
500 to 549	--	10.00
550 to 949	0.00	0.00
950 to 999	--	5.00
> 999	--	30.00

Table 3. Selected performance and carcass traits of steers stratified by respiratory tract lesions.			
	Respiratory tract lesion[a]		
Trait	None	Non-active	Active
Number of steers	117	78	9
Initial weight, lb	638	639	694
Weight d 137, lb	1161	1114	1092
ADGc, lb/day	3.48	3.14	2.58
Dressing percentage	63.6	63.6	61.8

Hot carcass wt, lb	738	709	677
Quality Grade			
Marbling score[b]	Sl40	Sl33	Sl03
Choice, %	5.1	3.8	.0
Select, %	86.3	78.2	66.7
Standard, %	8.6	18.0	33.3
Yield Grade	2.6	2.5	2.4
1, %	15.4	20.5	22.2
2, %	59.0	60.3	66.7
3, %	25.6	17.9	11.1
4, %	.0	1.3	.0

[a] Respiratory tract lesion: none = no lung lesions present; non-active = presence of a healed lesion from a previous respiratory infection; active = lesion plus active lymph node, reflecting active respiratory infection.
[b] Marbling score: Sl = "slightoo", the minimum required for U.S. Select.

Table 4. Expenditures, gross carcass value, and net return of steers stratified by respiratory tract lesions.

	Respiratory tract lesion[a]		
Trait, $/head	None	Non-active	Active
Number of steers	117	78	9
Total calf costs, $/hd	550.70	551.69	590.52
Medicine, $/hd	8.88	13.78	24.72
Feed cost, DM basis, $/hd	241.78	219.68	184.00
Yardage, $/hd	7.50	7.50	7.50
Total feed costs[b] , $/hd	249.28	227.18	191.50
Gross carcass value, $/hd	732.00	695.78	656.12
Net return, $/hd	(76.85)	(96.88)	(150.63)

[a] Respiratory tract lesion: none = no lung lesions present; non-active = presence of a healed lesion from a previous respiratory infection; active = lesion plus active lymph node, reflecting active respiratory infection.
[b] Total feed costs include feed cost plus yardage.

Table 5. Carcass value determination using 1995 and 1996 carcass premiums and discounts.

	Respiratory tract lesion[a]								
	None (n = 117)			Non-active (n = 78)			Active (n = 9)		
Grade/Class	Total lbs carcass	% Total weight	Value	Total lbs carcass	% Total weight	Value	Total lbs carcass	% Total weight	Value
Quality Grade									

Premium Choice	--	--	--	709.0	.01	0.03	--	--	--
Low Choice	4691.0	.05	0.00	1497.0	.03	0.00	--	--	--
Select	74687.5	.86	(6.05)	43683.9	.79	(5.53)	4304.0	.71	(4.95)
Standard	6969.0	.08	(1.21)	9391.1	.17	(2.55)	1785.0	.29	(4.40)
Yield Grade									
1	13133.0	.15	0.46	10984.0	.20	0.60	1370.0	.22	0.67
2	50902.0	.59	1.18	33371.9	.60	1.21	4089.0	.67	1.34
3	22311.9	.26	0.00	10140.1	.18	0.00	630.0	.10	0.00
4	--	--	--	785.0	.01	(0.17)	--	--	--
Carcass Weight - Total	86347.0			55281.0			6089.0		
500 to 549	--	--	--	1081.0	.02	(0.11)	526.0	.09	(0.86)
550 to 949	86347.0	1.00	0.00	54200.2	.98	0.00	5563.0	.91	0.00
Total Premium/Discount			(5.62)			(6.52)			(8.19)
Grid Price (Base Price[b] - Discount)			99.37			98.48			96.81

[a] Respiratory tract lesion: none = no lung lesions present; non-active = presence of a healed lesion from a previous respiratory infection; active = lesion plus active lymph node, reflecting active respiratory infection.

[b] Base carcass value = $105.00 for low Choice, yield grade 3.

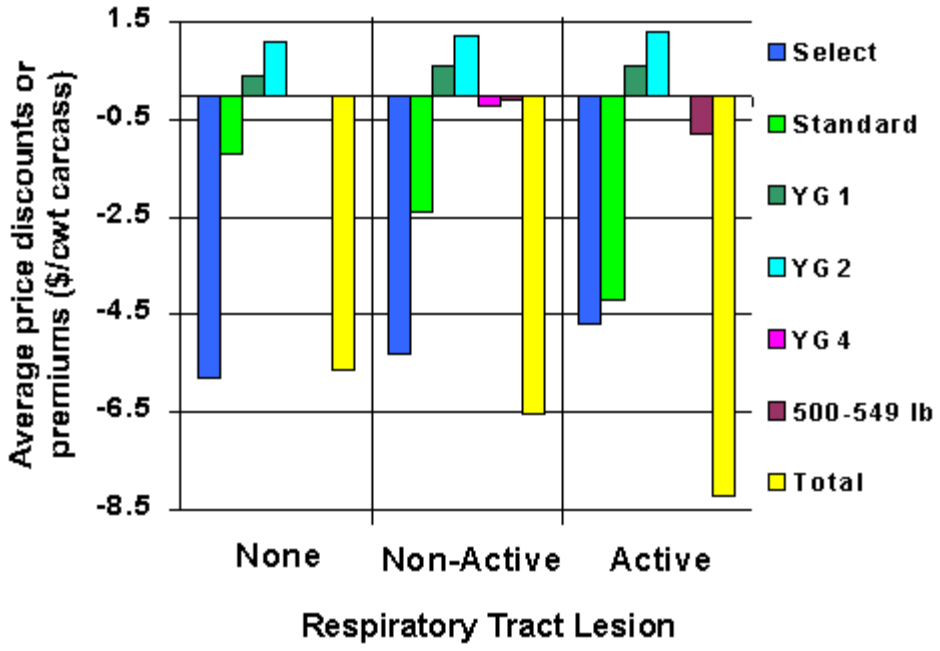

Figure 1. Carcass price premiums and discounts based on values presented in Table 2.

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