

A Retrospective Survey of Diseases of Feedlot Cattle in Alberta

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SUMMARY

A survey of feedlot managers was used to obtain information on disease occurrence, management practices and preventive techniques employed in feedlots in Alberta. Respiratory diseases were reported to be the most frequent causes of sickness and death. Costs associated with disease occurrence were estimated to be C \$15.6 million in feedlots in Alberta annually during the period under study.

RÉSUMÉ

Un relevé rétrospectif des maladies des bouvillons de parcs d'engraissement, en Alberta

Les auteurs ont utilisé des rapports de régisseurs de parcs d'engraissement pour colliger des données relatives à l'occurrence des maladies, aux méthodes de régie et à la médecine préventive utilisées dans les parcs d'engraissement, en Alberta. Les maladies respiratoires représentaient la cause la plus fréquente de maladie et de mortalité. Au cours de l'année couverte par ce relevé, le coût imputable à la maladie atteignit 15.6 millions de dollars.

INTRODUCTION

Disease in feedlot cattle is frequently a major concern of cattle feeders and veterinarians. Very little data on feedlot disease in western Canada has been published, partly because most feedlots in this area of Canada handle cattle for multiple owners and health and

performance information is confidential. Information on the occurrence of feedlot diseases and their effects is required in order to design treatment and preventive programs and to plan research efforts. This project was initiated to establish the importance of bovine respiratory and other diseases in Alberta feedlots. The purpose of this report is to present data on disease occurrence in feedlots, describe some of the management techniques utilized by feedlot managers and discuss the economic significance to the industry.

MATERIALS AND METHODS

The Alberta Cattle Feeders Association (ACFA) was contacted and agreed to participate in this study. It was estimated that there were 63 members of the ACFA in the four districts south of Edmonton, which each fed more than 250 head annually. Twenty-four feedlots willing to cooperate in the study were selected from the 1978 membership list of the ACFA. The feedlots selected were considered to be typical and representative of those in each district and were classified according to size, based on the number of cattle received annually. The number of feedlots interviewed in each size category and district was proportional to the actual distribution.

A detailed questionnaire covering the period from July 1, 1977 to June 30, 1978 was designed and utilized to collect data from the animal health and production records of each feed-

lot. The secretary-manager of the ACFA visited each feedlot in the latter part of 1978 and administered the questionnaire. In those cases where feedlot records were incomplete or unavailable, manager recall was utilized to obtain the data. The data was coded and entered into a computer for tabulation (6). The morbidity and mortality rates represent the total number which were treated or which died, expressed as a percentage of the total number of cattle received by each feedlot during the study period.

RESULTS

The feedlots surveyed were all located in Alberta south of Edmonton. The sample included nine in the small (0-3 999 head), seven in the medium (4 000-9 999 head) and eight in the large (over 10 000 head) categories. The aggregate number of cattle received was 249 144 during the study period. The mean number of cattle received was 10 381 and ranged from 800 to 52 630. An average of 145 cattle were kept in each pen but varied from 75 to 250. The proportion of cattle owned by individuals other than the feedlot owners ranged from 0 to 100% with a mean of 40.3%.

The methods of feeding and the concentrate-to-roughage proportions in the feed during the starting, growing and finishing periods used for calves and yearlings are summarized in Table 1. The average length of time used to bring yearlings on to full feed was 20.3

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TABLE I
METHOD OF FEEDING AND PROPORTIONS OF CONCENTRATE AND
ROUGHAGE USED IN ALBERTA FEEDLOTS

Feeding Methods	Calves		Yearlings	
	No. of Feedlots	Percent	No. of Feedlots	Percent
Self-feeders	1	1.2	3	12.5
Feed bunks	19	79.2	21	87.5
None fed	4	16.7	—	—
Feeding Period	Concentrate %	Roughage %	Concentrate %	Roughage %
Week 1	13.2	86.8	23.0	77.0
2	17.0	83.0	39.0	61.0
3	18.2	81.8	58.7	41.3
4	21.0	79.0	68.1	31.9
Average	17.4	82.6	52.8	47.2
Growing period	31.6	68.4	—	—
Finishing period	72.6	27.4	82.2	17.8

days with a maximum of 22 days. The mean maximum length of time that a pen would be held open for more arrivals at the feedlot was 15.2 days.

Fourteen feedlots routinely fed antibiotics, 13 fed monensin sodium, four incorporated melangestrol acetate in rations for heifers and one included organic iodide in the ration. Sixty-nine percent of calves originated in sales yards and 27% were received directly from the ranch of origin, while 75% of yearlings were obtained from sales yards and 24% were received from ranches (Table II). The transportation distance to feedlots from the source of the cattle was the greatest for sale and mixed groups. Of cattle received there were 59% steers, 39% heifers and 2% bulls. Cattle came from various locations in both Alberta and Saskatchewan and feedlot operators stated that cattle received from greater distances (480 km) seemed to be more susceptible to diseases.

Only eight percent of feedlots bought preconditioned calves or yearlings (Table II). Feedlot managers gave the following reasons for not obtaining preconditioned cattle: (a) existing programs were too varied, (b) cattle were not worth the premium demanded, (c) preconditioned cattle were not readily available, (d) the lack of certification of status.

The preventive and other procedures utilized after cattle arrived at the feedlot are listed in Table III. Infectious bovine rhinotracheitis (IBR) vaccine (either intramuscular or intranasal), clostridial vaccines, growth stimulants and branding were

utilized by all feedlots. Twenty-one feedlots used a pour-on preparation for warbles and 18 administered injectable vitamin A,D,E routinely.

The numbers of cattle received and their disposition for the period July 1, 1977 to June 30, 1978 are presented in Table IV. The overall mortality and culling rates were 1.18% and 0.48%, respectively. The mean proportion of cattle found dead with no treatment was 20.7% of the total number which died.

Feedlot managers were asked to report the numbers of cattle which required treatment or which died in various disease categories. This information was extracted from existing

records in just over one-half of the feedlots and owner recall was accepted in the rest. The diagnosis had been made almost exclusively by nonveterinarians. The mean and maximum morbidity and mortality rates reported by disease category in Alberta feedlots are summarized in Table V. The mean morbidity rate for all cattle received was 12.87%. In one feedlot, the overall morbidity rate was reported to be 68.59%. Respiratory diseases accounted for 58.7% of total morbidity and 61% of the mortality. The second most frequent causes of morbidity and mortality were musculoskeletal and enteric diseases respectively.

Nineteen feedlots reported that they utilized starting pens for the newly arrived cattle and all 24 feedlots utilized hospital pens for animals requiring treatment. Feedlot operators reported that the most useful criteria for the detection and diagnosis of illness was attitude, appearance and the observed respiratory pattern of the cattle in the feeding pens. Feedlot owners in the sample indicated that they utilized the services of veterinarians in the diagnosis and treatment of 14% of the sick cattle and 20 feedlot owners employed veterinarians for necropsy examination of about 20% of dead cattle. Twenty feedlots employed veterinarians on an "on-call" basis only and four had a herd health pro-

TABLE II
ORIGIN AND TIME OF YEAR CALVES AND YEARLINGS
WERE RECEIVED BY ALBERTA FEEDLOTS

	Direct Ranch	Preconditioned	Sales Yards	Mixed
	No. of Feedlots			
Calves				
(Sept.-Dec.)	11	6	10	2
(Jan.-May)	—	—	1	—
Other	2	1	6	1
None received	11	17	7	21
Percent of total	19	8	69	4
Average km travelled	131	101	211	253
Yearlings				
(June-Aug.)	2	—	1	—
(Sept.-Nov.)	7	3	5	1
(Dec.-Feb.)	—	—	2	—
(March-April)	1	1	1	—
Year round	5	—	13	2
None fed	9	20	2	21
Percent of total	16	8	75	1
Average km travelled	136	48	256	240

TABLE III
PREVENTIVE PROCEDURES EMPLOYED FOR CATTLE IN ALBERTA FEEDLOTS
AFTER ARRIVAL OF CATTLE

Preventive Procedures	No. of Feedlots			Average Days After Arrival
	Yes	No	Partly	
Vaccinations				
IBR-intramuscular	14	8	2	1.7
IBR-intranasal	12	9	3	1.9
Bov. virus diarrhoea	3	21	—	1.9
Blackleg-mal. ed.	21	3	—	1.1
Multi.-clostridial	24	—	—	1.0
Parasiticides				
Warbles-Pour-on	21	1	2	1.4
Oral dewormer	—	23	1	2.1
Injec. dewormer	6	16	2	2.0
Vitamins				
Vit. ADE-injec.	18	2	4	1.8
Growth stimulants				
Synovex S or H ^a	18	4	2	1.5
Ralgro ^b	11	11	2	1.8
Antibiotics				
Benz. penicillin	3	21	—	1.9
Sulfa in water	1	23	—	—
Other				
Branding	24	—	—	1.0
Ear tags	7	16	1	1.8
Dehorning	9	11	4	2.1
Castration	13	9	2	1.7

^aSynovex S (progesterone and estradiol benzoate), Synovex H (testosterone propionate and estradiol benzoate), Syntex Ltd., Montreal, Quebec.

^bZeronol. Brae Laboratories Ltd., Medicine Hat, Alberta.

gram with regular visits by the veterinarian.

Table VI summarizes the animal health expenses incurred by various categories. The total health cost varied from C \$3.16 to C \$11.73, with a mean of C \$6.94 per head received by the feedlots. The mean cost of veterinary services was the smallest item and was approximately one-tenth of the expense expended on drugs and vaccines.

The mean number of employees per feedlot was six, but varied from one to

20. Feedlots employed an average of one employee per 1 000 head of cattle.

Disease problems were listed as a major problem by 12 managers and 11 indicated availability of labour as their major problem. Other problems listed by a few managers included cattle sick on arrival, availability of health technicians, weather and cost of veterinary service.

DISCUSSION

In many feedlots, it was possible to obtain an accurate estimate of morbid-

ity and mortality rates on a body systems basis, whereas in others the information supplied were estimates only because of lack of detailed clinical and pathological records. Although feedlot personnel are usually able to make a reasonably reliable diagnosis on a body systems basis, an accurate etiological diagnosis usually requires the services of a veterinarian. Because there was a low usage of veterinarians in these feedlots, valuable information on the various components of the respiratory disease complex was not available.

In this study major disease problems in feedlot cattle were identified and quantified. Respiratory diseases, including shipping fever and IBR were responsible for approximately two-thirds of the sickness and deaths.

The overall mortality rate determined in this study compares closely to those previously reported from California, Colorado, Alberta and Ontario (2,3,4,5,7). However, the morbidity rate is 2.5 times higher than that previously reported from Colorado (4). The average culling rate of 0.48% was somewhat lower than the rates of 1.0% to 2.9% in California reported by Hjerpe (2) and Howard (3).

The information collected allows an estimate of the economic impact of disease occurrence in feedlots. Using an average mortality rate of 1.2% of all animals received and feeder cattle valued at C \$420 each (1977-78 values), the average loss due to mortality was C \$5.06 per head. The health cost for vaccines, medicines, veterinary fees and handling costs was estimated to be C \$6.94 per head, for a total of C \$12. Since respiratory diseases accounted for about 60% of the sickness and death loss, the mortality and health costs attributable to respiratory disease is C \$7.20 per head received. A recent study in Texas (1) has shown that calves recovering from shipping fever gained 5.45 kg per head less in the first 30 days of feeding than unaffected calves. (1.05 vs 0.86 kg per head per day). After this period, the cattle that had been sick performed equally as well as the animals that were not sick but the difference was maintained and they were marketed 5.45 kg per head lighter. If slaughter weight cattle are valued at C \$55 cwt (1977-78

TABLE IV
NUMBERS OF CATTLE RECEIVED AND DISPOSITIONS BY ALBERTA FEEDLOTS

Category	Mean ^a	Standard Deviation	Minimum	Maximum
Number received	10 381	12 101	800	53 000
Number sold	9 881	11 978	795	52 630
Total number died	100	100	5	318
Percent died	1.18	0.73	0.40	3.20
Number found dead	15	15	0	52
Percent of total deaths	20.7	15.2	0	50.0
Number culled	79	169	0	800
Culling rate %	0.48	0.55	0	1.88

^aThe mean values reported were obtained from the means reported in each category by individual feedlots. This accounts for the apparent discrepancies in the percentages.

TABLE V
MEAN AND MAXIMUM MORBIDITY AND MORTALITY RATES REPORTED
BY DISEASE CATEGORY

Disease Category	Morbidity		Mortality	
	Mean %	Maximum %	Mean %	Maximum %
Shipping fever	4.66	15.62	0.43	1.12
I.B.R.	3.31	42.86	0.18	1.71
Total respiratory	7.55	50.09	0.72	3.00
Rumen overload	0.39	3.12	0.07	0.62
Bloat	0.37	1.71	0.11	0.29
Coccidiosis	0.23	1.88	0.06	0.71
Total enteric	1.01	4.00	0.22	0.88
Hemophilus (ITEME)	0.26	3.12	0.06	0.29
Total nervous	0.32	3.12	0.09	0.29
Footrot	2.65	14.29	0.00	0.00
Total musc-skel.	2.73	14.29	0.02	0.12
Bullers	0.44	2.00	0.00	0.01
Castration inf.	0.28	4.15	0.01	0.16
Calving	0.36	3.29	0.04	0.41
Total uro-genital	1.18	4.69	0.01	0.14
Total disease	12.87	68.59	1.18	3.20

TABLE VI
ANIMAL HEALTH EXPENSES REPORTED BY ALBERTA FEEDLOTS STRATIFIED
BY HEALTH COMPONENTS

Health Components	Mean ^a C\$	Standard Deviation C\$	Minimum C\$	Maximum C\$
Veterinary service	2 102	4 823	99	24 000
Drugs and vaccines	25 677	26 396	2 000	90 000
Handling costs	47 158	57 002	560	238 500
Total	78 629	85 124	3 560	342 000
Total cost per head Received in the feedlot	6.94	2.25	3.16	11.73

^aPer feedlot

values), this difference would amount to C \$6.60 per head. Based on a total morbidity rate of 7.55% for respiratory diseases, the loss from morbidity would be C \$0.50 per head received. Therefore, the estimated total costs due to respiratory disease in Alberta feedlots in 1977-1978 would be approximately C \$7.70 per head received. Since approximately 1 250 000 head of slaughter grade steers and heifers were marketed at abattoirs and stockyards in Alberta from July 1, 1977 to June 30, 1978 the estimated cost of respiratory disease in Alberta feedlots is C \$9.6 million annually. The total cost associated

with the occurrence of all diseases in feedlots in Alberta is estimated to be C \$15.6 million annually.

The observations made in this survey suggest that feedlot managers should make greater efforts to keep more detailed health records and to involve the veterinary profession to a greater extent in determining the reasons for morbidity and mortality. Since disease in feedlots is usually a complex of several diseases occurring simultaneously, accurate clinical and pathological diagnoses are necessary for the design of preventive and therapeutic programs. These should be primarily designed to reduce the mor-

bidity rates and consequently the mortality rates associated with diseases of feedlot cattle. Future research into feedlot respiratory diseases should include the influence of management and preventive techniques on disease occurrence and the effect of disease occurrence on animal performance in feedlots. Adequately funded studies of management practices and cattle performance would likely be the most effective means of addressing these questions.

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