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Baseline Management Practices and Animal Health Data Reported by US Feedlots Responding to a Survey Regarding Acute Interstitial Pneumonia

Amelia R. Woolums, *DVM, MVSc, PhD, DACVIM, DACVM*[1]; **Guy H. Loneragan,** *BVSc, PhD*[2]; **Larry L. Hawkins,** *DVM*[1]; **Shamita M. Williams,** *BS*[1]

[1]*Department of Large Animal Medicine, College of Veterinary Medicine, University of Georgia, Athens, GA 30602*

[2]*Division of Agriculture, West Texas A&M University, Canyon, TX 79016*

Dr. Hawkins' current address: Bayer HealthCare LLC, P.O. Box 390, Shawnee, KS 62727

Abstract

Little is published regarding management practices at US feedlots. As part of a study to characterize management practices related to feedlot acute interstitial pneumonia (AIP), baseline health and management data were collected by a cross-sectional survey sent to 561 feedlots in 21 states. Of 72 surveys (12.8%) returned, 53% came from Kansas and Nebraska. The total number of cattle placed by respondents was 2,495,439, representing approximately 10% of cattle placed in feedlots in 2000. Respondents placed 1,385,644 steers, 1,011,905 heifers, 48,987 Holsteins and 48,903 other cattle. Viral respiratory vaccination was common, while fewer feedlots vaccinated against bacterial respiratory pathogens. Sixty-one percent of respondents practiced mass antimicrobial administration to cattle, although only 17% of all cattle were mass-treated. Hormonal implants were used by 92% of feedlots, and approximately 80% of them used a final implant containing trenbolone acetate (TBA). Heifers were implanted with products containing higher doses of TBA than steers. Monensin and melengestrol acetate were included in the summer finishing diet by 97% and 75% of the respondents, respectively. Sixty-five percent of animals that died received a postmortem examination. Bovine respiratory disease complex (BRD) was the leading cause of morbidity and mortality: 12.8% of placements were treated for BRD, and 0.8% died of BRD. Of all placements, 1.3, 1.6 and 2.6% of cattle were treated for AIP, digestive disorders and all other diseases, respectively; 0.1, 0.3 and 0.2% of placements died of AIP, digestive disorders and all other diseases, respectively.

Résumé

Il y a très peu de publications portant sur les pratiques de gestion dans les parcs d'engraissement aux États-unis. Dans le cadre d'une étude visant à caractériser les pratiques de gestion qui sont reliées à la pneumonie interstitielle aiguë (PIA) dans les parcs d'engraissement, des données sur le niveau de santé de base et la gestion ont été recueillies à l'aide d'une enquête transversale impliquant 561 parcs dans 21 états. Parmi les 72 questionnaires reçus (12.8%), 53% provenait du Kansas et du Nebraska. Le nombre de bovins détenus par les répondants était de 2,495,439 ce qui représente approximativement 10% du bétail qui se trouvait dans les parcs d'engraissement en 2000. Il y avait 1,385,644 bouvillons, 1,011,905 taures, 48,987 bovins de race Holstein et 48,903 bovins d'autres types détenus dans les parcs des répondants. La vaccination contre les virus respiratoires était courante mais moins de parcs pratiquaient la vaccination contre les pathogènes respiratoires bactériens. Un total de 61% des répondants utilisaient l'administration de groupe d'agents antimicrobiens bien que seulement 17% de tout le bétail était traité de cette façon. Les implants hormonaux étaient utilisés dans 92% des parcs et près de 80% d'entre eux utilisaient un implant terminal avec de l'acétate de trenbolone (TBA). Les taures recevaient des implants avec de plus fortes doses de TBA que les bouvillons. Le monensin était inclus dans la ration de finition d'été dans 97% des parcs et l'acétate de mélengestrol dans 75% des cas. Un total de 65% des animaux qui mouraient étaient examinés post mortem. Le complexe respiratoire bovin (BRD) était la cause la plus commune de morbidité et de

mortalité : 12.8% des animaux en parc étaient traités pour le BRD et 0.8% en sont morts. Il y avait 1.3% des animaux en parc traités pour la PIA, 1.6% pour les problèmes digestifs et 2.6% pour d'autres maladies. Le taux de mortalité était de 0.1% pour la PIA, de 0.3% pour les problèmes digestifs et de 0.2% pour les autres maladies.

Introduction

Feedlot management practices are aimed at producing finished cattle in an efficient, cost-effective and timely manner. Some decisions, such as the purchase of auction market-derived calves, may favor greater profit margins, but also result in increased animal disease burdens. While decisions made by feedlot managers can mean the difference between profit and loss, little published information is available regarding management practices in US feedlots.

One poorly characterized disease of feedlot cattle which may be caused in part by factors related to management is acute interstitial pneumonia (AIP). Feedlot AIP is characterized by a relatively acute onset of severe respiratory distress which is often fatal despite treatment.[7,9] Grossly, lungs of affected cattle are found at postmortem to fail to collapse; interstitial edema and emphysema is apparent and the lung tissue may be abnormally dark in color, or may have a "checkerboard" appearance due to interspersion of dark and pale lobules. Histologically, alveolar "hyaline membranes" are present, with proliferation of type II pneumocytes, interstitial edema and sometimes hemorrhage, and, later, inflammatory cell infiltrate.[2,7,9] Acute interstitial pneumonia most commonly affects cattle that have been on feed greater than 45 days.[7,9,11] Feedlot AIP appears to occur more commonly in summer, and in some studies heifers are disproportionately affected.[2,11,13] In the 1999 National Animal Health Monitoring System (NAHMS) feedlot study, AIP was reported to be the second leading cause of morbidity of feedlot cattle, after bovine respiratory disease complex (BRD), or shipping fever.[21] Although the cause of AIP in feedlot cattle is uncertain, diet-related pneumotoxins cause AIP in other settings,[4,6,23] suggesting that dietary factors might also contribute to feedlot AIP. In one study, groups of cattle in which one or more animals died from a digestive disorder were 1.7 times more likely to experience AIP.[12] Certain feed additives have been suggested to increase[2,13,14,17] or decrease[14] occurrence of feedlot AIP. In addition to feed-related issues, other management factors such as implant strategies have been proposed to contribute to development of the disease.[14] Unfortunately, studies testing many of the above hypotheses are lacking. These variables are not easily tested because AIP occurs sporadically in feedlot cattle and experimental reproduction of the disease has not been accomplished. Observational studies are needed to identify factors associated with disease risk.

In an effort to construct a preliminary characterization of management factors influencing risk of feedlot AIP, a questionnaire was developed and sent to managers of feedlots in several states. The questionnaire was designed to collect data regarding type of cattle placed, therapeutic and preventative health practices administered to cattle at arrival (processing practices), characteristics of the summer finishing diet and general causes of morbidity and mortality. In order to establish the characteristics of feedlots that will be used in an evaluation of the association of management strategies with risk of AIP, the descriptive data from all feedlots responding are presented here. These data represent a cross section of current management practices in US feedyards and provide a rare view of a wide variety of decisions made by feedlot managers. The results of further evaluation of the data to determine associations between management practices and AIP occurrence are reported separately.[24]

Materials and Methods

Identification of Feedlots

Feedlots enrolled in the survey were selected from a comprehensive directory of US feedlot operations[a] and by soliciting state cattle industry organizations for addresses. Feedlots with greater than 5,000-animal capacity were actively selected. However, it was not always possible to distinguish placement numbers from the lists provided by state organizations, so in some cases feedlots surveyed placed fewer than 5,000 cattle.

Questionnaire

A questionnaire was designed to collect data on the location of the feedlot, the type and number of cattle placed by the feedlot, processing practices, the components of the summer finishing diet and causes of morbidity and mortality recognized at the feedlot. Respondents were asked to consider AIP to include cases described as follows: "Sudden onset of severe respiratory distress (open mouth breathing, swayback appearance, grunting when breathing). Cattle may be found dead unexpectedly. At postmortem, lungs fail to collapse and may have a patchwork or "checkerboard" appearance (dark and pale patches intermixed). When the lung is cut into, the cut surface may appear shiny or wet. There may be large air pockets in the lung." The respondents were asked

whether AIP was recorded as a cause of death separate from other respiratory diseases, and whether AIP was a cause of morbidity or mortality at the yard. Several feedlot consultant veterinarians were asked to evaluate the questionnaire and provide input regarding its content and design. Respondents were asked to provide data for lots of cattle placed in the year 2000.

Questionnaires were sent to 561 feedlots in 21 states; questionnaires were addressed to the feedlot manager and mailed out during December 2000. Four weeks later, a reminder card was sent to each feedlot, requesting that the questionnaire be returned if it had not already been returned. Six weeks after the reminder card was sent, a second questionnaire was sent to all feedlots, with a note requesting that the questionnaire be returned if it had not already been returned.

Data were entered into a purpose-designed electronic database.[b] Data were then imported into a commercially available statistical analysis software package.[c] Descriptive statistics were generated. Each feedlot contributed an equal weight to the analysis when the percentage of feedlots undertaking a given procedure was described. When the percentage of cattle was described, each feedlot was assigned a weight equal to total placements. If results pertained to a specific class of animal, then the weight reflected class-specific placements.

Results

Questionnaires Returned

A summary of the questionnaire distribution to feedlots is listed in Table 1. The majority of questionnaires, 67%, were sent to feedlots in Texas, Kansas, Nebraska and Colorado. Seventy-two questionnaires (12.8%) were returned and 66 of the questionnaires (91.7%) contained sufficient data for inclusion in the analysis. The six feedlots that did not provide usable data reported placing no cattle during the time period of interest or were no longer in business. As a percentage of the questionnaires sent to the state, the most questionnaires were returned from Nebraska (26.7% returned), North Dakota (26.7% returned) and South Dakota (25% returned). As a percentage of all ques-

Table 1. Location and number of feedlots surveyed, with percent of surveys returned for each state.

State	Number of surveys sent (percent of surveys sent)	Number of surveys returned	Percentage returned from state	Percentage of all surveys returned
Arizona	10 (1.8)	0	0	0
California	22 (3.9)	1	4.5	1.5
Colorado	53 (9.5)	4	7.6	6.1
Iowa	9 (1.6)	0	0	0
Idaho	12 (2.1)	2	16.7	3.0
Indiana	1 (0.2)	0	0	0
Kansas	138 (24.6)	19	13.8	28.8
Minnesota	1 (0.2)	0	0	0
Missouri	3 (0.5)	0	0	0
Montana	19 (3.4)	2	10.5	3.0
North Dakota	30 (5.4)	8	26.7	12.1
Nebraska	60 (10.7)	16	26.7	24.2
New Mexico	14 (2.5)	2	14.3	3.0
Nevada	5 (0.9)	0	0	0
Oklahoma	17 (3.0)	0	0	0
Oregon	5 (0.9)	0	0	0
South Dakota	8 (1.4)	2	25.0	3.0
Texas	125 (22.3)	8	6.4	12.1
Utah	8 (1.4)	1	12.5	1.5
Washington	14 (2.5)	1	7.1	1.5
Wyoming	7 (1.3)	0	0	0
Total	561	66	11.8[a]	99.8[b]

[a] Percentage of all surveys mailed that were returned.
[b] Total not equal to 100 due to rounding.

tionnaires that were returned, 53% were returned from feedlots located in Kansas and Nebraska. Feedlots in Kansas, Nebraska, Texas and Colorado accounted for 71.2% of the questionnaires returned.

Number and Type of Cattle Placed

Data regarding number and type of cattle placed by responding feedlots are presented in Table 2. Respondents placed 2,495,439 animals that included 1,385,644 steers, 1,011,905 heifers, 48,987 Holsteins and 48,903 other animals (such as cows and bulls). Of the animals placed, 76% were yearlings, 20% were calves and 4% were other classes of cattle. Forty-nine percent of cattle were purchased through sale barns, 49% were acquired by direct farm purchase (not passing through sale barns) and 2% were acquired by other means. Responding feedlots tended to place more steers than heifers or other cattle (including cows and bulls), although some responding feedlots placed only heifers or only steers. The majority of cattle placed by responding feedlots were English or Continental-type cattle or their crosses, although some respondents placed only *Bos indicus*-type cattle.

Processing Practices

Data regarding vaccines administered to cattle are presented in Table 3. Vaccines for viral respiratory pathogens, including bovine herpesvirus-1 (BHV-1, also known as infectious bovine rhinotracheitis virus, IBR), bovine virus diarrhea virus (BVDV), parainfluenza type 3 virus (PI3) and bovine respiratory syncytial virus (BRSV) were more commonly administered than were vaccines for bacterial respiratory pathogens such as *Haemophilus somnus, Mannheimia haemolytica* and *Pasteurella multocida*.

Respondents were asked whether any cattle were mass-treated with an antibiotic at arrival to prevent pneumonia. Forty of the 66 feedlots (61%) reported that at least some cattle received mass treatment to prevent pneumonia at arrival. For all feedlots reporting the use of mass treatment, the mean percent of cattle placed that received mass treatment was 17% (standard error [SE] 4.5%).

Feedlot managers were asked whether implants were used, and if so, what percentage of steers, heifers, or other animals were implanted. Sixty-one of the 66 responding feedlots (92%) reported that implants were used. In feedlots that used implants, 99.4% of steers, 98.3% of heifers and 91.1% of Holsteins were implanted. Of feedlots reporting use of implants, 92% reported that all steers were implanted and 88% reported that all heifers were implanted. Managers were also asked to name the brand of terminal implant used in steers and heifers. A variety of brands were reported; the three brands most commonly reported for use in steers included Component TES[d] (21.7% of feedlots), Revalor S[e] (16.7% of feed-

Table 2. Total number of cattle placed, and number placed by gender, age, and type at all responding feedlots.

	Mean	Median	Minimum	Maximum
Number of cattle placed	38,391	20,000	546	224,658
Number placed by gender				
Heifers	15,567	5,241	0	180,200
Steers	21,317	9,911	0	200,407
Holsteins	754	0	0	24,000
Others (including cows and bulls)	752	0	0	35,000
Number placed by age				
Yearlings	29,006	12,000	0	198,846
Calves	7,567	4,000	0	63,600
Others	1,568	0	0	59,000
Number placed by source				
Sale barn	15,931	8,000	0	100,000
Direct farm (no sale barn travel)	15,707	4,200	0	146,519
Other sources	752	0	0	35,000
Percent placed by type				
English, continental, or crosses[a]	68%	70	0	100
Bos indicus breeds[b]	29%	30	0	100
Dairy breeds[c]	3%	0	0	25

[a] For example, Angus cross, Charolais cross.
[b] Brahman-type, including Brahman-mix.
[c] Holsteins or others.

Table 3. Percent of feedlots (n = total reporting) that vaccinated all cattle placed with each vaccine, and median, mean, and minimum and maximum percentage of cattle vaccinated with each vaccine.

Vaccine	Yards vaccinating all cattle (%)	Median percentage of cattle vaccinated	Percentage of cattle vaccinated	Minimum – maximum percentage vaccinated
IBR (n = 65)	95	100	98	50-100
BVD (n = 64)	89	100	94	0-100
PI3 (n = 64)	70	65	59	0-100
BRSV (n = 64)	72	80	60	0-100
Clostridial (n = 65)	66	70	51	0-100
H. somnus (n = 65)	40	0	22	0-100
Pasteurella or *Mannheimia* (n = 64)	30	10	28	0-100

Table 4. Percentage of all feedlots using final implant containing trenbolone acetate (TBA) for steers (total reporting, n = 48) or heifers (total reporting, n = 51), and level of TBA used in steers and heifers.

	Percentage of all feedlots
Steers: final implant contains TBA	81.3
If TBA used, final implant contains 120-140 mg	60.4
If TBA used, final implant contains 200 mg	20.8
Heifers: final implant contains TBA	80.4
If TBA used, final implant contains 120-140 mg	17.0
If TBA used, final implant contains 200 mg	61.7

lots) and Synovex Plus[f] (16.7% of feedlots). The three brands most commonly reported for use in heifers were Synovex Plus[f] (31% of feedlots), Revalor H[e] (17.2% of feedlots) and Component TH[d] (10.3% of feedlots).

Data relating to the terminal implant used are presented in Table 4. When implants were categorized by active ingredient, 81.3% of feedlots were using a final implant containing trenbolone acetate (TBA) in steers, and 80.4% of feedlots used a final implant containing TBA in heifers (Table 5). Implants containing higher doses of TBA were more commonly used in heifers, with 61.7% of feedlots using TBA implants containing 200 mg TBA in heifers, while only 20.8% used implants containing 200 mg TBA in steers.

Diet Components

Data regarding the summer finishing diet (diet fed during the summer to cattle in the final stages of feeding) are presented in Table 5. Grain was the predominant component and corn was most commonly fed. While the percentage of "other grain" used was relatively small when corn was included in the diet, when feedlots reported using no corn in the finishing diet the mean percentage of "other grain" included was 81%. Both silage and hay were commonly used as roughage sources. Forty-one respondents reported the type of hay fed, with 40 (98%) reporting that alfalfa hay was fed and one respondent reporting that wheat hay was fed. Feedlots reported using a variety of protein sources, and non-protein nitrogen was the most commonly reported, with 47% of responding feedlots feeding non-protein nitrogen. Various by-products were fed by responding feedlots, with no by-product fed by a clear majority of feedlots (Table 5).

Five of 55 responding feedlots (9%) reported feeding roughages other than silage or hay. Other roughages fed included straw, cotton seed hulls, and sunflower hulls. Nine feedlots of the 66 responding reported feeding grains other than corn; grains reported included barley, wheat, wheat middlings, milo and rice bran. Sixteen feedlots of the 66 responding reported feeding other protein sources than soybean products, non-protein nitrogen, or cottonseed products; other protein sources used included canola meal, feather meal, "liquid" (presumably liquid protein

Table 5. Percentage (with standard error, SE) of each ration component in summer finishing ration in feedlots reporting.

Component	Percentage on dry matter (DM) basis when sole source fed (SE)	Percentage on DM basis when any other source also fed (SE)	Number of feedlots using commodity/number feedlots reporting (percentage)
Roughage			
Silage	7.5 (2.2)	7.2 (1.2)	37/55 (67%)
Hay	6.6 (1.7)	4.8 (0.8)	46/57 (81%)
Other[a]	0.0	1.1 (0.8)	5/55 (9%)
Grain			
Corn, steam flaked	75.2 (2.8)	8.0 (3.1)	23/57 (40%)
Corn, dry rolled	74.5 (2.8)	11.0 (3.0)	27/57 (47%)
Corn, high moisture	0.0	10.5 (2.7)	14/57 (25%)
Corn, other	81.3 (1.9)	2.5 (1.5)	7/57 (12%)
Other grain[a]	81.0 (-)	3.6 (1.4)	56/57 (98%)
Protein source			
Soybean products	1.8 (0.5)	0.5 (0.2)	14/54 (26%)
Non-protein nitrogen	2.1 (0.5)	1.5 (0.6)	26/55 (47%)
Cottonseed products	0.0	0.7 (0.5)	5/55 (9%)
Other protein source[a]	2.8 (0.7)	0.9 (0.4)	19/55 (35%)
By-products			
Tallow	1.0 (0.3)	1.1 (0.5)	21/21 (100%)
Distillers' by-products	3.1 (1.3)	1.1 (0.8)	10/10 (100%)
Vegetable oil or fat	0.0	0.2 (0.1)	5/5 (100%)
Corn by-product	4.8 (2.0)	1.9 (1.1)	11/11 (100%)
Other by-products[a]	1.8 (1.0)	1.9 (1.1)	9/52 (17%)

[a] See Results section for list of other components reported.

supplements), "pellet" (presumably pelleted protein supplements), "premix" and sunflower meal. Ten of the 66 responding feedlots reported feeding by-products other than tallow, distillers' by-products, vegetable fat or oil, or corn by-products; other by-products fed included beet pulp, cheese whey, corn gluten, molasses and potatoes or French fries.

Feedlot managers were asked whether monensin, other ionophores, or MGA were included in the summer finishing diet. Monensin was reported to be included in the summer finishing diet for all cattle (heifers and steers) by 63 of 65 respondents (97%). Twenty-two correctly entered the dose of monensin used, and for those feedlots the mean dose used was 28 g/ton (0.87 SE). Three of 65 (5%) reported using other ionophores. Of 64 respondents, 48 reported using MGA in the final finishing diet for heifers (75%). The mean dose of MGA fed to heifers was reported to be 0.43 mg/animal/day (0.01 SE).

Animal Health Data

Feedlot managers were asked what percent of dead animals received a postmortem examination performed by a veterinarian, feedlot employee, or other person. Of animals that died, postmortem examination was performed on 65% (4.6% SE). Ten of the 64 responding feedlots (16%) indicated that no animals received a postmortem examination.

Data regarding the percent of all placements treated for various conditions are presented in Table 6. Feedlot managers were asked to report the percentage of placements treated for fibrinous pneumonia (shipping fever or bovine respiratory disease complex, "BRD"), AIP (if recorded separately from BRD), digestive disorders and all other diseases; they were also asked to report the percent of placements that died of these conditions. Forty-two respondents answered these questions; of these, nine reported the proportion of animals treated for various conditions rather than the percent of all placements affected. Not surprisingly, bronchopneumonia (BRD) was the condition for which cattle were most often treated, with 12.8% of placements treated for BRD. Of the cattle placed on feed, 1.3, 1.6 and 2.6% were treated for AIP, digestive disorders and other diseases, respectively.

Data regarding the percent of all placements that died from various conditions are also presented

Table 6. Percentage of placements treated and percentage of placements that died by disease (with standard error, SE), in feedlots responding (total reporting, n = 33).

	Percent (SE)
Percent of placements treated for BRD	12.57 (1.71)
Percent of placements treated for AIP	1.28 (0.43)
Percent of placements treated for digestive disorders	1.56 (0.37)
Percent of placements treated for all other disease	2.63 (0.87)
Percent of placements that died due to BRD	0.75 (0.06)
Percent of placements that died due to AIP	0.13 (0.04)
Percent of placements that died due to digestive disorders	0.27 (0.04)
Percent of placements that died due to all other diseases	0.15 (0.03)

in Table 6. Of all animals placed on feed, 0.75% died from BRD, 0.13% died from AIP, 0.27% died from digestive disorders and 0.15% died from all other diseases. The proportion of cattle dying from the various conditions was determined for all respondents (n = 42). The proportional mortality for all feedlots reporting was greatest for BRD at 55.8%; 10.4% of cattle dying were reported to have died due to AIP; 19.8% died due to digestive disorders; and 15.2% died due to other conditions (total not equal to 100% due to averaging).

Discussion

Results of this survey as reported by the responding feedlots provide a comprehensive description of current management practices in US feedlots, and as such, the data offer a rare view of management decisions made by feedlot managers across the country. The information presented represents an industry snapshot that can serve as a baseline of animal health parameters that feedlot managers, consultants and researchers may use as benchmarks in evaluating feedlots they service or study.

New information provided by this survey includes an estimate of proportional mortality specifically due to AIP in US feedlots. Previous studies have reported AIP mortality rates as a percent of all cattle placed, with mortality rates of 0.03-0.15% reported.[7,9] As a cause of 10.4% of mortality in feedlots responding to this survey, AIP represents a significant cost to the responding operations. The cost of AIP is amplified by the fact that the disease occurs late in the feeding period when animals are close to a desirable harvest weight.[2,10] It is of interest that the reported percentage of cattle treated for AIP (1.3%) was lower in this study than in the NAHMS feedlot study, published by the USDA in 2000 and 2001,[19-21] where 3.1% of cattle were reported to have been treated for AIP.[21] The difference in reported rate of treatment for AIP may be related to the small percentage of surveys returned in this study; it may also be related at least in part to the inclusion of a definition of AIP in the present survey. A definition was included in an effort to improve accuracy of the estimate of disease burden.

Implants to promote growth and feed efficiency were used by the majority of responding feedlots, and the data presented here reveal specifically the types of implants chosen by feedlot managers for the final phase of the feeding period. While a variety of implants are used, it is clear that some choices predominate. Specifically, implants containing TBA are commonly used as the final implant, and heifers were typically treated with implants containing higher doses of TBA than steers. To our knowledge, this is the first description of specific types of implants utilized for the final finishing phase in a wide cross section of US feedlots.

Where comparable data are available, the results of this survey generally agree with other reports. For example, results of the NAHMS survey indicated that the gender breakdown of cattle placed in surveyed feedlots was 57% steers, 41% heifers and 2% cows and bulls.[19] In comparison, the breakdown reported by respondents in this survey was 55% steers, 41% heifers, 2% Holsteins and 2% cows and bulls. Similarly, vaccination practices reported in the NAHMS study were in agreement with those reported here; for example, in the NAHMS study the mean percent of cattle vaccinated against IBR, BVD, PI3 and BRSV was 97, 88, 74 and 71%, respectively.[20] In this study, the mean percent of cattle vaccinated against IBR, BVD, PI3, and BRSV was 98%, 94%, 59% and 60% (Table 3).

Prior to this report, the most recent published data describing surveys of feedlot management practices were collected from Canadian feedyards in the

1980s.[3,8,15] Because changes in management practices occur over time, and because of differences in the size and location of the subject feedyards, it is doubtful whether the data from those reports are comparable to modern US feedlot practices. Some differences were particularly notable when the results of these older Canadian studies were compared to the results of the present study. In a report describing management practices in feedlots in Ontario, Canada, 16.9% of feedlots reported administering intranasal IBR vaccine to cattle, and only 21% reported administering intramuscular IBR vaccine.[8] In a second report, respondents also indicated that vaccination for respiratory viral pathogens was not widespread; 8% of cattle entering feedlots in Ontario received intranasal IBR-PI3 vaccine, 30% received intramuscular IBR-PI3 and only 2% received BVD vaccine.[15] In contrast, a survey from the same time period conducted in Alberta, Canada, indicated that at least some cattle at all of 24 feedlots surveyed received IBR vaccine.[3]

Proportional mortality by disease in this survey agreed with recognized breakdowns of feedlot mortality. The majority of deaths were attributed to respiratory disease (fibrinous pneumonia and AIP), in agreement with data presented by others where mortality due to respiratory disease has been reported to account for 44-67% of all feedlot mortality.[3,5,7,10,18,22] Percent of cattle dying due to digestive disorders in this survey was also similar to that previously reported, with digestive disorders previously reported to cause 14-36% of feedlot mortality.[5,18,22]

The majority of US cattle on feed are in Texas, Kansas, Nebraska and Colorado.[16] Because the majority of surveys returned in this study were from these four states, the results may be viewed as representative of current cattle feeding practices in the US. As with many observational studies, self-selection bias may make extrapolation beyond the respondents tenuous. However, where comparable data are available, results are similar to national estimates reported elsewhere. Moreover, the total number of cattle placed by responding feedlots was 2.5 million, representing approximately 10% of the US feedlot cattle population placed in 2000.[16] As a proportion of the number of surveys mailed, the largest proportion of surveys were returned from Nebraska, North Dakota and South Dakota. Although the results of this study shed light on many important management practices used by US feedlots, limitations of the study include the relatively poor rate of completed surveys returned (12.8%), which may have led to nonresponse bias,[1] and selection bias, in that the survey was specifically aimed to characterize management practices associated with AIP.[24] Thus, it may be that managers who took the time to respond to the survey were more often those with an interest in AIP. In spite of this, 12 of the 65 responding feedlots stated that AIP was not a problem for their feedlot, indicating that some respondents took the time to complete the survey even though AIP was not perceived to be a problem for their feedlot. Another limitation is that respondents may simply have guessed their responses and not checked their records to ascertain the correct response. However, in spite of these limitations, when similar questions were posed in both the present survey and the NAHMS study, similar results were frequently observed. Data from the NAHMS survey were taken from responses by 520 of 1,250 (41.6%) selected feedlots.[19] The fact that the NAHMS questionnaires were administered by personal interview may account for the improved response rate in that study. Nonetheless, the agreement in responses to similar questions in the two surveys strengthens the validity of the results presented here, which provide data not previously available regarding mortality rates attributable to AIP, specific implants used in the final finishing phase and the nature of the final finishing diet fed to US cattle. An analysis of the relationship between specific management practices and the occurrence of AIP at responding feedlots is reported elsewhere.[24]

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Footnotes

[a] *Beef Spotter, The Feedlot Atlas.* Amarillo, Texas: Beef Spotter, 2000

[b] Microsoft Access, Microsoft Corporation, Seattle, WA

[c] SAS Institute Inc, Cary, NC

[d] VetLife, DeMoines, IA

[e] Intervet Inc, Millsboro, DE

[f] Fort Dodge Animal Health, Fort Dodge, IA

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Abstract

Strategies for the Control of Milk Fever

Husband J.

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In the past 25 years, average milk yields in the UK national herd have increased by 30 per cent and it is expected that they will continue to rise. The lactational demands on the dairy cow make it almost unique in its inability to maintain calcium homeostasis at parturition. Hence, milk fever or clinical periparturient hypocalcaemia is an important production disease in dairy animals, with an estimated annual incidence of 4 to 9 per cent in the UK. Milk fever depresses rumen contractility and is associated with other periparturient disorders such as retained placenta, dystocia, displaced abomasum, mastitis, lameness and ketosis. Periparturient disease and impaired rumen function can cause a drop in feed intake and worsen the precarious postpartum energy status of a cow. Ketosis and negative energy balance in the postpartum period, in turn, exert a strong influence on fertility. By offering the correct advice, it is often fairly easy to reduce the incidence of clinical and subclinical periparturient hypocalcaemia on farm. This article highlights the importance of a proactive, preventive approach, especially bearing in mind the cost of the disease and its association with several other periparturient disorders. This can provide a valuable opportunity for the practitioner to become more involved in herd nutrition.