RAILED CATTLE MORTALITIES IN QUEENSLAND

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SUMMARY

In 1980, 96 854 cattle were surveyed to determine the effects of various factors on mortalities during rail transit. The overall mortality rate was 0.10%. Factors significantly ($P < 0.01$) associated with high mortality rates included: mixing of sexes in wagons, absence of a drover, leanness, wild temperament, and transit time of 36 hours or longer. Bulls had a significantly ($P < 0.01$) higher mortality rate than all other cattle and cows than steers/bullocks.

INTRODUCTION

Climatic, nutritional and behavioural stress, as well as physical injury, are known to cause mortalities among cattle (Hungerford 1970; Church 1976; Siebert and Macfarlane 1975). There is increasing recognition of the scope for such factors, singly or combined, to cause mortalities during transportation. However, only limited information (Bisschop 1961) is available about their effects on mortality rates among cattle during road or rail transport.

During the summer of 1978/79 there was great public concern about mortalities occurring among railed cattle in Queensland. Consequently, a study (QMIOMA 1981) was made of the incidence, and causes, of mortalities among railed cattle. This paper reports on a survey of 96 854 railed cattle undertaken for that study. The survey was conducted to assess the importance of possible causes of mortalities and to provide information on transport procedures.

MATERIALS AND METHODS

The survey was conducted from 10 March to 16 June 1980. It covered 15 major loading and 13 unloading points, plus 4 spelling (resting) yards, throughout the State. The spelling yards were both loading and unloading points. Data were collected for all cattle transported between survey points. At loading points livestock agents, drovers and spelling yard operators recorded data on the type of cattle being loaded and their management prior to loading. At unloading points train guards recorded the number and sex of mortalities in each wagon plus the wagon number and type. Loading and unloading information for each train was later matched and transit times between loading and unloading points calculated. The survey measured only mortalities evident in wagons at the end of rail journeys. It was not possible to include mortalities occurring in unloading yards even though they may have been caused by the journey. A mortality was defined as either a dead animal or one unable to walk from the wagon. The latter animals are normally humanely killed.

Chi-squared tests were used to examine relationships between single possible causal factors and mortality rates. Log-linear analysis, to analyse simultaneously relationships between several possible causal factors and mortality rates, was not attempted because only 101 mortalities were recorded.

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RESULTS

Some important features of the five sex/age categories surveyed are shown in Table 1. Steers/bullocks (37.1%) and cows (36.1%) were the major sex/age categories encountered. The overall mortality rate was 0.10%. The range was from 0.44% for bulls to 0.06% for steers/bullocks and yearlings/calves. Except for heifers, transit time means and S.D.'s were similar for each category. The overall mean transit time was 28.6 hours. Only 15.1% of the cattle were not accompanied by a drover and between category differences were small. However, there were large between category differences in the lean, wild and mixed sexes percentages.

TABLE 1 Characteristics of cattle surveyed

		Bulls	Heifers	Cows	Steers/ bullocks	Yearlings/ calves	Total
No. surveyed		2 520	12 243	34 925	35 953	11 213	96 854
Mortality rate (%)		(0.44)	(0.11)	(0.14)	(0.06)	(0.06)	(0.10)
Transit time (h)	mean	30.6	18.4	28.1	28.2	31.6	28.6
	S.D.	9.4	9.1	8.8	9.1	8.2	9.0
Condition	No.†	2 520	12 243	34 872	35 953	11 183	96 771
	% lean	(17.1)	(24.1)	(5.7)	(1.6)	(27.2)	(9.3)
Use of drover	No.†	1 775	11 534	20 767	22 936	8 108	65 120
	% drover absent	(21.9)	(8.5)	(17.3)	(12.2)	(25.9)	(15.1)
In-wagon mixing	No.†	1 915	4 334	34 386	30 652	8 972	80 259
	% mixed sexes	(40.5)	(35.3)	(17.3)	(13.4)	(15.5)	(17.1)
Temperament	No.†	1 758	11 650	21 662	23 100	8 808	66 978
	% wild	(44.3)	(25.2)	(9.0)	(12.5)	(22.7)	(15.8)

† Total number for which information available.

The distribution of all cattle by various transit time intervals is presented in Table 2. An important feature is that 18.2% of the cattle were in transit for 36 hours or longer.

TABLE 2 Distribution of cattle by time in rail transit

	Hours					
	< 12	12 – 23	24 – 35	36 – 47	⩾48	Total
No.	2 618	21 246	55 381	12 276	5 333	96 854
(%)	(2.7)	(21.9)	(57.2)	(12.7)	(5.5)	(100)

The mortality rates associated with several possible causal factors are shown in Table 3. The highest rate was 0.44% for bulls. Other factors associated with high rates were: mustering by helicopter or motor-bike (0.29%), mixed sexes in wagons (0.26%), absence of drover (0.23%), lean condition (0.21%), wild temperament (0.20%) and transit time of 36 hours or longer (0.20%). Mortality rates did not differ significantly between cows and heifers but the rate for cows was significantly higher than for steers/ bullocks (0.14 v 0.06%). Rates were not significantly different between fat and medium conditioned cattle but lean cattle

had a significantly higher rate than medium/fat cattle **(0.21 v 0.09%)**.

TABLE 3 Mortality rates associated with selected factors

Factor		No. surveyed	No. dead	Mortality rate (%)	X^2
Sex/age	Bulls	2 520	11	0.44	27.88*
	Others	94 334	90	0.10	
	Heifers	12 243	14	0.11	0.37
	Cows	34 925	48	0.14	
	Cows	34 925	48	0.14	11.40*
	Steers/bullocks	35 953	21	0.06	
Condition	Fat	51 843	40	0.08	3.56
	Medium	35 966	42	0.12	
	Lean	8 962	19	0.21	10.99*
	Fat/Medium	87 809	82	0.09	
Temperament	Wild	10 556	21	0.20	6.60*
	Quiet	56 418	59	0.10	
In-wagon mixing	Mixed sexes	13 752	36	0.26	36.10*
	One sex	66 507	51	0.08	
Transit time	⩾ 36 hours	17 609	36	0.20	20.61*
	< 36 hours	79 245	65	0.08	
Mustering method	H'pter/m.bike	4 408	13	0.29	5.30†
	Horse	24 260	34	0.14	
Drover	Absent	9 845	23	0.23	12.20*
	Present	55 275	56	0.10	

(* $P < 0.01$, †$P < 0.05$)

DISCUSSION

The results indicated that several cattle characteristics and handling procedures were significantly related to mortality rates. The most important factors were: condition, sex/age status, temperament, mixing of sexes in wagons, use of train drovers and long transit times. However, these findings should be interpreted cautiously mainly due to the possible unmeasured interactions of these and other factors on mortality rates. Consequently, as in the study (QMIOMA 1981), the results can be used only to draw broad conclusions about the main causes of mortalities and should be interpreted in conjunction with other information.

Railed cattle in Queensland do not have access to water during rail transit yet many are in transit for 36 hours or longer (Table 2). These cattle had significantly higher mortality rates than other cattle. Dehydration occurring before and during the journey could explain this result. Further technical and economic investigations are needed into the effects of dehydration on the welfare of railed cattle.

Fewer mortalities than expected occurred during the survey. This was mainly because the overall mortality rate was much lower than anticipated from our earlier study of other data sources (QMIOMA 1981). The main factors responsible for the low rate were probably: extra care taken with cattle; the high proportion of drover-accompanied cattle; and the non-recording of **some mortalities**.

Railed cattle mortality rates are low and there are many possible causes of mortalities. Consequently, large amounts of data are required for the accurate estimation of factor effects among a survey population. This survey demonstrated the difficulty of obtaining such data.

The measurement of metabolic parameters among cattle during or after rail journeys, or in simulated transit conditions, may identify some causal factors and indicate when their effects may become critical. Such information would greatly assist policy making. However, it is not available, except for the results of an investigation of the metabolic status of 50 seriously injured and 142 other railed cattle undertaken as part of the QMIOMA study (QMIOMA 1981).

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