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A STUDY OF ACUTE TOXIC MASTITIS IN COWS

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An ongoing study on toxic mastitis in cattle aimed at identifying the risk factors associated with the occurrence of the condition at an individual cow and herd level is currently being carried out. The other objectives of the project are to identify the bacteria involved in such cases as well as to assess the effectiveness of various treatment regimes and also to determine if any clinical or laboratory assessments can act as accurate prognostic indicators. Twenty veterinary practices have been asked to submit clinical information along with milk and blood samples from cases of toxic mastitis they encounter. Follow-up matched case control information was sought from the relevant farmers. From the clinical and laboratory results obtained from the first 150 cases, a binomial linear regression model was constructed which indicated that cows which were recumbent, leucopenic and uraemic had the highest probability of dying (0.81 s.e.0.135).

A recent survey on causes of mortality in cattle in Northern Ireland identified coliform mastitis as the single most important cause of death in dairy cows (Menzies and others 1995). As a follow up to this finding, a study on acute toxic mastitis is being carried out with the aims of identifying the risk factors associated with the occurrence of the condition on an individual cow and herd basis, identifying the bacteria involved in such cases and assessing the effectiveness of various veterinary treatment regimes. Another objective is to determine if any of a variety of clinical or diagnostic tests can be used as an accurate prognostic indicator.

Veterinary surgeons from 20 practices submit milk and blood samples along with clinical details relating to cases of acute toxic mastitis they examine. Milk samples are cultured and routine haematology, urea and creatinine measurements are performed on the blood samples.

Questionnaires are then sent out to the relevant farmer requesting further information on the cow which suffered from the mastitis and from a matched control animal from the herd. The matched control animal was selected as the cow which calved immediately after the cow which suffered from the toxic mastitis.

Analyses has been carried out on the first 150 cases from this ongoing study. Almost half (48%) of all cases occurred within the first week after calving. Hind-quarters were twice as likely to be affected by toxic mastitis. Half (52%) of the milk samples yielded pure growths of *E. coli*. Most acute toxic mastitis cases (63%) made a full recovery or suffered a reduction in milk yield from the affected quarter while 15% of cows died from the condition and a further 22% were culled prematurely from the herd because of the mastitis.

A statistically significant increase in mortality from acute toxic mastitis was observed in those cows which had subnormal rectal (<101°F) temperature ($P<0.001$), were recumbent ($P<0.001$), were less than 8 days calved ($P<0.05$), had elevated urea or creatinine levels ($P<0.001$) or had a high packed cell volume ($P<0.05$).

A generalised linear model assuming binomial distribution was fitted to the data. In the resultant model, recumbency, white blood cell count (WCC) and urea were the significant terms and were used in the model to estimate the proportion of animals which died from toxic mastitis (Table I).

Table I
Proportion of cattle with toxic mastitis which died as indicated by initial veterinary examination.

Cow able to stand up?	WCC ($X10^9$/l)	Urea >8.3 mmol/l (s.e.)	Urea <8.3 mmol/l (s.e.)
No	<4	.81 (0.135)	0.33 (0.247)
No	>=4	.22 (0.172)	0.03 (0.045)
Yes	<4	.26 (0.143)	0.04 (0.053)
Yes	>=4	.02 (0.020)	0.00 (0.005)

More comprehensive analyses will be undertaken upon completion of data collection. This will include analyses of the individual risk factors associated with the occurrence of toxic mastitis. Collection of additional information on farm management practices will also enable quantification of risk factors at the herd level.

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