

THE PREVALENCE AND RISK FACTORS FOR MORTALITY IN SPRING LAMBING FLOCK: A CROSS SECTIONAL STUDY

L.E. Green, I. Cox, S. Rizvi, R. Hanagan and S. Knox

Department Clinical Veterinary Science, University of Bristol,
Langford.

Introduction

An area of great concern within the sheep industry world-wide is the level of lamb mortality. Losses of between 10% and 15% have been generally acknowledged within the UK; this reflects over 4 million lambs per year, the majority of these die within the first seven days of birth. Small, male lambs from multiple births are at greatest risk.

The overwhelming majority of lamb deaths can be divided into four categories: starvation/hypothermia/exposure, stillbirth/dystocia, infectious disease and abortion. These share common underlying risk factors, for example poor maternal nutrition, insufficient colostrum intake, poor hygiene at lambing and cold stress.

Lamb mortality not only represents a considerable financial loss, it has also been highlighted as an area of poor welfare and may affect public perception of the sheep industry. The United Kingdom has the largest sheep flock in the European Union and also has historically high welfare standards, it is therefore very important that we lead the field in reducing lamb mortality. The aims of this project were therefore to:

- a) estimate the proportion of neonatal (less than 7 days old) lamb deaths from spring lambing flocks scattered through the UK in 1997,
- b) to identify the management factors associated with these deaths and
- c) to identify areas where information transfer from researchers to farmers needs improving.

Materials and Methods

A questionnaire was designed to collect the information listed above. It was pilot-tested on a local sheep farmer and sent to the Sheep Veterinary Society executive committee and also to the co-ordinating members of staff at Bristol, Cambridge, Edinburgh, Glasgow, Liverpool and London veterinary schools for comment. The final version was distributed to the co-ordinators and forwarded to all first year veterinary undergraduates to fill in during their lambing practice in the Easter vacation of Spring 1997.

Each student received:

Lambing Record Sheet: recorded number of lambs born alive, dead or mummified, plus any fostering, for 300 ewes per farm.

Lamb Death Sheet: recorded sex, age at death, plus number of siblings for up to 100 lambs per farm.

Flock History Questionnaire: related to management procedures in the last year, the occurrence of abortion, disease and vaccination, nutrition throughout the year and production Tables.

Lambing Questionnaire: divided into separate sections for indoor / outdoor lambing, and including details of aid during lambing, cleaning practices, and general lamb management.

Condition score sheet: each student was requested to personally condition score 50 ewes.

A £100 prize for the best student report at each university was advertised using posters to encourage students to participate in the study and return the questionnaires.

The questionnaires were returned to Bristol between April and August 1997. The data were entered into a database (FoxPro 3.2); frequency distributions and simple analysis were then performed in Epi Info 6.03.

Results

Of the 585 questionnaires issued, 108 were returned, reflecting an average return rate of just under 20%. This was highly variable between schools, one school did not return any questionnaires.

Overall lamb mortality reported by farmers for 1996 - 7 ranged from 9 to 11%, with lambs being most likely to die in the immediate post-partum period (Table 1). Male lambs and those with several siblings were at increased risk. There were associations between low pre-turn out mortality (<2%) and farmers reporting, routine use of antibiotics (OR=2.67), presence of hot boxes (OR=3.64), presence of isolation

Table 1
Lambing percentage and mortality by flock type

Lambing results	Geographical flock type		
	Hill	Upland	Lowland
Lambing percentage	1.43	1.58	1.71
Lambs born dead (%)	2.38	4.40	4.70
Lambs dying before turn out (%)	6.30	2.63	2.81
Lambs dying after turn out (%)	1.90	1.85	1.81

facilities (OR=4.14) and the use of intra-peritoneal glucose injections for hypothermic lambs (OR=3.16). (Table 2).

Table 2
Factors associated with pre-turnout mortality less than two percent.

Associated Factor		< 2%	2%	OR	95% CI	P
Antibiotics routinely used	Y	31	12	2.67	1.02 - 7.25	0.022
	N	32	23			
Presence of hot-boxes	Y	35	13	3.64	1.37 - 10.13	0.004
	N	16	22			
Presence of isolation facilities	Y	46	24	4.14	1.16 - 17.05	0.012
	N	5	11			
Use of IP injections	Y	12	40	3.16	0.87 - 15.02	0.067
	N	3	32			

CI = confidence interval

The routine use of antibiotics was associated with the farmer reporting that watery mouth was not a problem (OR=3.03) (Table 3). Keeping lambs in mothering pens for greater than 72 hours was associated with the farmer reporting a problem with navel ill (OR=3.25) (Table 4). Flocks with a lambing period of greater than 6 weeks had an increased risk of pre-turnout deaths (OR=3.70) and pneumonia (OR=2.50) (Table 5).

Table 3
Association between antibiotics and watery mouth.

Factor		Watery mouth		OR	95% CI	P
		Yes	No			
Antibiotics routinely used	Y	33	14	0.33	0.09 - 1.04	0.030
	N	43	6			

Table 4
Association between time kept in and navel ill

Factor		Navel ill		OR	95% CI	P
		Yes	No			
Lambs kept in for > 72 hours	Y	56	17	3.25	1.03 - 10.24	0.022
	N	10	10			

Table 5
Association between lambing duration and lamb pneumonia

Factor		Lambing duration (weeks)		OR	95% CI	P
		6	> 6			
Pre-turn out mortality	< 3%	37	6	0.27	0.08 - 0.84	0.010
	3%	30	18			
Lamb pneumonia in 1996	Y	23	16	0.40	0.14 - 1.06	0.034
	N	44	12			

Table 6
Students reports of body condition score of ewes
(total examined = 4813)

Body condition score	Number of ewes	% of ewes
1 - 1.5	501	10.4
2 - 2.5	2102	43.7
3 - 3.5	1841	38.3
4 - 4.5	343	7.1
5	26	0.5

Warming aids were absent on 15% of farms, and when present they were in low numbers and are mainly the less desirable heat lamps rather than hot boxes. The technique of intra-peritoneal glucose injections was also rarely used.

Results from the farmer interview indicated that, at tupping, 15% of farmers aimed for and 20% achieved average body condition scores (BCS) of sheep below those recommended (2.5, 3 and 3.5 for hill, upland and lowland flocks respectively). By lambing 30% of sheep had average condition scores below recommended levels (2, 2.5 and 3) and 33% of these had BCS 1.5 or less (Table 6). Over 75% of farms had at least one ewe with BCS 1.5 or less. BCS done by the students indicated significant variation between farm types, hill sheep had lower BCS than upland or lowland sheep. Students taught to BCS by farmers reported significantly higher BCS than students taught by Vet. Schools.

Discussion

Results from this study indicate that farmer reporting of mortality is similar to previous estimates of lamb mortality. Several management factors were seen to be significantly associated with reduced lamb mortality. These include the presence of both isolation and warming facilities, which if adopted by more farmers may reduce mortality further. It was disconcerting, though perhaps not surprising to find that the routine use of antibiotics was associated with reduced mortality. Finally, the results from this study

indicate that the target levels for body condition score are not known by all farmers and the current method of body condition scoring is not consistent between users which may make it an ineffective technique. Since it is vital to the success of all aspects of sheep production that ewes and rams are in adequate body condition, this should be an area of concern to all the sheep industry.

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