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MORE LIGHT ON LAMB LOSSES

Third and final report of a survey of lamb mortalities in W.A.

By S. M. DENNIS, B.V.Sc., Ph.D., Senior Veterinary Pathologist, Animal Health Laboratory

DURING the past three years the Department of Agriculture’s Animal Health Laboratory carried out an investigation into the causes of perinatal lamb losses. This article records the results of this work.

Lambs and specimens from lambs were submitted to the Animal Health Laboratory from 334 properties in 162 areas in this survey during 1965. Post-mortem examination was carried out on 2,238 lambs and specimens from 25 lambs were also examined.

Since the survey commenced in 1963, a total of 4,417 lambs together with specimens from another 233 lambs have been examined. These lambs came from 695 properties in 225 areas. The yearly distribution of the specimens received is given in Table 1.

Classification of Lambs

All lambs examined were classified according to time of death and were placed in one of three main categories namely:

- APD—Anteparturient death (died before the birth process began).
- PD—Parturient death (died during birth).
- PPD—Post-parturient death (died after birth).

The classification of lamb deaths over the past three years is given in Figure 1. Almost three-quarters of the lambs died after birth, a fifth died during birth, and one-twentieth were dead before the birth process began.

The time distribution of death for lambs which died after birth is shown in Figure 2. A third of the lambs (34.1 per cent.)

Table 1.—Lambs and specimens submitted to the Animal Health Laboratory during 1963-1965.

<table>
<thead>
<tr>
<th>Year</th>
<th>Lambs</th>
<th>Placentae*</th>
<th>Other</th>
<th>Lamb equivalents**</th>
<th>Total No. of Lambs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>757</td>
<td>240</td>
<td>825</td>
<td>147</td>
<td>904</td>
</tr>
<tr>
<td>1964</td>
<td>1,422</td>
<td>232</td>
<td>96</td>
<td>61</td>
<td>1,483</td>
</tr>
<tr>
<td>1965</td>
<td>2,238</td>
<td>310</td>
<td>81</td>
<td>25</td>
<td>2,263</td>
</tr>
<tr>
<td>Total</td>
<td>4,417</td>
<td>782</td>
<td>1,002</td>
<td>233</td>
<td>4,650</td>
</tr>
</tbody>
</table>

* Placenta (afterbirth) or part thereof.
** Number of lambs from which specimens were submitted.
died within 24 hours and the remainder died within three to four weeks, with the great majority (52.6 per cent.) dying during the second or third day of life.

Weight of Lambs

The weight of the lambs examined varied between 2 oz. and 22 lb. (dry weight) with an average of 7.5 lb. Most of the weights were between 4 lb. and 10 lb.

Perinatal Lamb Losses

Perinatal lamb losses may be broadly divided into infectious and non-infectious causes. The results of this survey show that the non-infectious causes are more important in Western Australia. The causes of lamb losses in this State in order of importance were shown to be:

- Starvation/mismothering/
exposure complex.
- Dystocia or difficult birth and prolonged birth.
- Flock and individual lamb infections.
- Predators.
- Congential abnormalities.

The term perinatal simply means around birth and is a convenient inclusive term to cover most lamb deaths. "Complex" means a collection of signs or symptoms and in this case refers to three conditions that are inter-related.

Non-infectious Causes

The non-infectious causes of perinatal lamb mortality on a flock basis were:

- Starvation/mismothering.
- Dystocia and prolonged birth.
- Neonatal weakness.
- Exposure.
- Predators.
- Congential abnormalities.

Just over a fifth (22.7 per cent.) of the properties which submitted lambs had a history of and/or revealed signs of clover disease. To what extent clover disease influenced the losses is not known.

Starvation/Mismothering

Starvation was the greatest single cause of death and accounted for one-third (33.6 per cent.) of all the lambs examined and nearly a half (46.6 per cent.) of the deaths occurring after birth. The starved lambs walked and were active, but did not suck and usually died within the first three days of life, that is, they died from uncomplicated starvation. A number of other deaths were complicated by exposure, bacterial infection or predator attack; this is classed as complicated starvation. The findings relating to starvation/mismothering are summarised in Table 2.

Almost two-thirds (64.4 per cent.) of the lambs examined that died after birth revealed evidence of starvation; 57.8 per cent. of these lambs, however, showed mutilation after death by predators. It is these latter cases that many farmers record as predator deaths.
Table 2.—Starvation/mismothering in lambs in Western Australia during 1963-1965

<table>
<thead>
<tr>
<th>Starvation</th>
<th>No. of Lambs</th>
<th>Percentage of deaths after birth caused by starvation</th>
<th>Percentage showing post mortem predator damage*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncomplicated</td>
<td>1,483</td>
<td>46-6</td>
<td>60-9</td>
</tr>
<tr>
<td>Complicated</td>
<td>564</td>
<td>17-7</td>
<td>50-5</td>
</tr>
<tr>
<td>Total</td>
<td>2,047</td>
<td>64-4</td>
<td>57-8</td>
</tr>
</tbody>
</table>

* 1964 and 1965.

**Dystocia**

Parturient deaths were responsible for the death of one fifth (20.5 per cent.) of the lambs examined. The most important class of parturient death was that occurring at the end of a birth of long duration; this accounted for just over a half (50.9 per cent.) of the losses occurring during the birth process. These lambs were usually larger than normal (average weight 9.8 lb.) and invariably had swollen heads; some revealed ruptured livers.

The weight range for parturient deaths varied widely from 1.5 lb. to 18 lb., with an average of 8.1 lb. (dry weight). A summary of the parturient deaths is given in Table 3.

There was no significant difference between the weight of parturient lamb deaths associated with autumn, winter or spring lambing.

Thirty per cent. of the parturient deaths showed predator mutilation.

**Neonatal Weakness**

The second largest class was neonatal weakness, which was responsible for one-sixth (16.3 per cent.) of the post-parturient losses. These lambs died from a number of causes, infectious and non-infectious, or both. Clinically they were seen as weak full-term lambs that breathed but were unable to rise and walk, with death occurring within a few minutes to a few hours of birth.

**Predators**

Predators only accounted for 2.7 per cent. of the losses and did not play a significant part in the deaths of the lambs examined.

The results of this survey indicated that predators, mainly foxes and crows, in general act simply as scavengers and virtually confine their attention to dying or dead lambs. This is illustrated by the fact that a third (1964) to a half (1965) of all the lamb carcasses showed evidence of predator mutilation, after death. This is further emphasised by the fact that 57.8 per cent. of the lambs that died from starvation/mismothering (the major cause of loss) were mutilated by predators after death.

Predator deaths, however, were shown shown to be a problem on individual properties during the past three years.

**Congenital Abnormalities**

Four hundred and one malformed lambs were examined during 1963-65 and the common abnormalities found were:

Missing lower jaw; undershot lower jaw; limb defects (bowed forelegs, limbs twisted

Table 3.—Parturient deaths examined during 1963-1965

<table>
<thead>
<tr>
<th>Duration of birth</th>
<th>No. of lambs</th>
<th>Average dry weight (lb.)</th>
<th>Percentage of parturient deaths</th>
<th>Percentage Total of lambs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>87</td>
<td>6-2</td>
<td>9-6</td>
<td>1-9</td>
</tr>
<tr>
<td>Moderate</td>
<td>169</td>
<td>7-5</td>
<td>18-7</td>
<td>4-4</td>
</tr>
<tr>
<td>Long</td>
<td>649</td>
<td>9-1</td>
<td>71-7</td>
<td>14-2</td>
</tr>
<tr>
<td>Total</td>
<td>905</td>
<td>8-1</td>
<td>100-0</td>
<td>20-5</td>
</tr>
</tbody>
</table>
Pathological Conditions

Post-mortem examination of the lambs revealed a number of pathological lesions, some of which were: Broncho-pneumonia, enteritis, hernia, ruptured liver, jaundice, arthritis, enlarged hearts, patent interventricular septum (hole in the heart), encephalitis or inflammation of the brain, goitre or enlarged thyroid gland, focal supplicative myocarditis (inflammation of heart), abscesses in the liver, kidneys and lungs, navel-ill and peritonitis, as well as a range of congenital abnormalities.

CONCLUSION

This survey has accomplished its purpose, namely, to define the causes of perinatal lamb losses in Western Australia. It has shown that the major cause of loss is starvation/mismothering. It has also provided valuable information to assist the advisory services of the Department in the further task of endeavouring to reduce perinatal lamb mortality.

It has also made the farming community aware of the existence of a lamb mortality problem.

Reduction of the high incidence of lamb deaths sustained each year in Western Australia will require concerted and continuing efforts by sheep breeders. The whole question of the enormous lamb wastage in the State is a complex one which is due to many factors that may vary from property to property.

The result of this survey, however, indicates that the most profitable avenue of approach to the problem of reduction of lamb losses is by a concerted effort on the most important cause of loss, namely starvation/mismothering.

ACKNOWLEDGMENTS

Investigations of this nature are impossible without the co-operation of many people. I wish to thank all the farmers who have co-operated in this survey and particularly those farmers who went to considerable trouble. My thanks also to the Departmental officers who assisted during this period.

and fixed in abnormal positions, “amputated” limbs); blind anus; inverted lower eyelid; one or both testes not in the purse; split purse and groove along length of the penis; heart defects.

Infectious Causes

Infectious organisms causing perinatal lamb losses may be divided into two categories, namely, flock pathogens that are of major significance and individual pathogens that are usually of minor importance.

The flock abortion-producing diseases that have been diagnosed in Western Australia during the past three years are:

<table>
<thead>
<tr>
<th>Disease</th>
<th>No. of Confirmed Outbreaks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibriosis</td>
<td>46</td>
</tr>
<tr>
<td>Listeriosis</td>
<td>14</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>4</td>
</tr>
<tr>
<td>Toxoplasmosis</td>
<td>3</td>
</tr>
<tr>
<td>Salmonellosis</td>
<td>2</td>
</tr>
</tbody>
</table>

The percentage of properties submitting lambs that were positively affected with these flock pathogens during the past three years was 9.6 per cent. This figure however, does not indicate the degree of infection on a State-wide basis.

Listeriosis and toxoplasmosis were diagnosed in sheep in Western Australia for the first time during the survey and ovine brucellosis was shown to be a cause of abortion and perinatal lambs loss as well as a cause of epididymitis in rams.

In addition, 15 other bacterial species were found to be responsible for 31 cases of sporadic abortion losses.

Sporadic or individual infections have been shown over the past three years to be responsible for 7.6 per cent. of the lamb deaths examined. This is apart from the lambs dying as a result of infection due to flock pathogens.

Many of these individual infections were the result of contamination of the navel cord at birth and others were acquired by ingestion, while yet others were superimposed complications upon an already existing condition such as starvation.
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