10. Managing Ewes through Pregnancy and Lambing

Chris Shands

Learning objectives

Students will:

- Understand how real time ultrasound scanning fits into an annual flock reproduction program
- Understand different aspects of lambing management
- Understand the range of predators that influence lamb survival
- Understand the differences between primary and secondary predation
- Have the skills to identify different reasons why lambs die from birth to two weeks of age
- Understand target fat scores and nutritional needs through pregnancy

Key terms and concepts:

Foetal growth
Real time ultrasound scanning
Fat score and nutritional targets
Predation
Lamb loss
Birth trauma
Lambing management

10.1 Introduction

Targeted nutrition is essential to achieving high flock reproductive performance. Throughout this topic there will be reference to pasture benchmarks required to ensure nutritional requirements are met. These will be described in terms of herbage mass (kg DM/ha) and herbage quality (% DM digestibility). So as to reliably meet these pasture benchmarks, the timing of phases on the breeding calendar must synchronise with the seasonal supply of pasture.

The period from mid pregnancy through to lamb marking and weaning is critical to the profitability of the sheep enterprise. The fact that lamb losses from birth through the end of the first week of life can be huge should alert managers to examine all aspects of the production system and put actions in place to ensure that these losses are minimised. This needs to be done in a coordinated way to cover all variables that cause reproductive wastage in the flock.

10.2 Healthy, fat score 3 ewes at lambing are important to ensure lambs are vigorous and will improve lamb survival.

Foetal growth
In early pregnancy there is no significant requirement for additional feed and ewes should be maintained at their joining fat score until scanning, at around day 100 after the start of joining. Nutrition of ewes through joining and pregnancy should be maintained to enhance embryo survival and implantation in the uterus.
Rapid weight gain or loss at joining may reduce embryo survival, consequently target weights and fat scores should be reached prior to joining. At about 40 days after conception the placenta begins to grow and continues its rapid growth until about day 95. This is followed by foetal development from day 90 to lambing. Foetal number is important and an indication of its effect is that singles, twins and triplets need at least double their maintenance ration at lambing. The placenta and foetus represents a considerable mass within the uterus and the forage/ration should be energy dense so as to enable sufficient intake.

The birth weight of a lamb is affected by sex, litter size, placental development, ewe condition, genetics, gestation length, and the timing, quality and quantity of nutrition during pregnancy. The average birth weight for singles or twins is different between years but an indication of a good pregnancy is where the average birth weight of twin second cross lambs is over 4 kg and, for twin Merino lambs, is over 3.5 kg. Lamb birth weight has a major bearing on lamb survival.

**Real-time scanning**

Pregnancy diagnosis to identify dry, single-bearing and multiple-bearing ewes is a practical procedure using real time ultrasound, which can bring about savings on resources, increase management options and monitor reproductive performance. By diagnosing ewes that are carrying more than one lamb, additional management can be adopted to ensure high survival rates.

Pregnancy scanning is conducted around 100 days from the commencement of joining to allow late lambs to be accurately identified. A short joining period is needed to ensure accurate detection of multiple pregnancies. Ewes should then be separated into dry, single or multiple lambing groups.

**Nutrition**

Ewes should have a target fat score of three by day 100, which corresponds with scanning, and from that period it is important to avoid severe under-nutrition. Metabolisable energy (ME) levels should be at 10 MJ/kg DM or better. Avoid major changes in nutrition of the ewe during pregnancy.

Table 1 shows the pasture requirements (kg DM green/ha) for ewes in late pregnancy and recommended pasture (kg DM green/ha) for ewes from scanning to lambing

| Table 10.1: Pasture requirements (Kg DM green/ha) for ewes in late pregnancy and recommended pasture/Kg DM green/ha for ewes from scanning to lambing. Source: Shands, (2007). |
|---|---|---|
| Ewes | Days pregnant | Last two weeks |
| | Days 100–128 |  |
| Single bearing | 900 | 1,000 |
| Twin-bearing | 1,000 | 1,200 |

**Fat score four and five ewes**

Ewes that are fat score four or five at day 100 (from start of joining) are usually over fat for lambing. To avoid spinal cord and other injuries at birth, fat score four or five ewes should be reduced by half a fat score. This can be done for about 28 days after scanning by grazing on pasture of 300 kg DM green/ha which is a significant nutritional restriction. After 28 days they should be grazed on the pasture recommendations in Table 1. Only restrict nutrition on over fat ewes if you know the stage of pregnancy. This four-week mid-pregnancy management strategy produces normal lamb birth weights and ewe gestation length.

Fat score four and five ewes also have a reduced intake in late pregnancy that reduces the amount of energy the ewe has for the lambing process. In addition these ewes have a hormonal imbalance that affects their ability to lamb and delays the production of colostrum.

The restricted ewes have higher intakes before lambing and minimal lambing problems.

However there are additional management inputs required to accommodate a six-week joining period and between ewe differences in initial fat score and weight loss. Using harnessed rams at joining will determine if a ewe has been mated and at what stage in the joining. This enables you to work out the number of days the ewe has been pregnant.
Controlling fat score at this stage of pregnancy will:

- Reduce risk of pregnancy toxaemia
- Reduce lambing difficulties
- Save feed
- Increase lamb birth weights and survival
- Provide flexibility if the season collapses.

**Supplements**

If you are unable to provide the pasture recommendations presented here it is necessary to provide a supplement. The use of a program such as GrazFeed® is recommended to determine the correct level of the high energy density supplement to be fed.

**Vaccination prior to lambing**

Ewes given a booster vaccination four to six weeks before lambing confer passive immunity on their lambs through the colostrum. The immunity lasts only six to eight weeks and a full vaccination program should be commenced at marking. Some vaccines also contain selenium to combat white muscle disease in selenium deficient areas or Vitamin B12 for cobalt deficiencies. Lambs should receive their first injection at marking then a follow up (booster) at weaning.

A six-in-one vaccination as a minimum is recommended.

**Predator control**

Predators should be controlled at least six weeks before lambing commences. Foxes should be controlled annually during August/September regardless of time of lambing to control new born cubs. Control programs are also recommended for spring/summer joining.

<table>
<thead>
<tr>
<th>Predator</th>
<th>Problem or risk</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feral pigs</td>
<td>Kill lambs</td>
<td>Poisoning, fencing</td>
</tr>
<tr>
<td></td>
<td>Disrupt lambing</td>
<td>Shooting, trapping</td>
</tr>
<tr>
<td>Foxes</td>
<td>Kill viable and non-viable lambs</td>
<td>Baiting, fencing, shooting, guard dogs, alpacas</td>
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<tr>
<td></td>
<td>Disrupt lambing</td>
<td></td>
</tr>
<tr>
<td>Crows/ravens</td>
<td>Injure and kill lambs</td>
<td>Trap and relocate</td>
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<tr>
<td></td>
<td>Injure ewes</td>
<td></td>
</tr>
<tr>
<td>Wild dogs</td>
<td>Kill adults and lambs</td>
<td>Bait, fencing, shooting, guard dogs, alpacas</td>
</tr>
<tr>
<td>Eagles</td>
<td>Can take viable lambs</td>
<td>Trap and relocate (seek permit from conservation agency)</td>
</tr>
</tbody>
</table>

Note: The removal of carcasses and debris applies to all predators. For native birds check with the conservation agency in your state what can be done legally to limit the problem.

**Shearing/crutching**

Avoid shearing ewes six to eight weeks before lambing as it increases the nutritional requirements of the ewe to maintain body weight.

Crutching three to four weeks before lambing will clean around the udder and assist the new born lamb to find the teats on the udder, ensuring the lamb gets a feed of colostrum as soon as possible after birth.

**Pregnancy toxaemia**

Pregnancy toxaemia is a disorder of fat metabolism characterised by elevated levels of ketone bodies in the blood. Pregnancy toxaemia is the outward sign that the pregnant ewe has been suffering from nutritional stress for some time and is now critically stressed.
Multiple bearing ewes in late pregnancy have the highest nutritional demands. If these demands are not met they are more likely to succumb to pregnancy toxaemia. When more than one ewe is affected the multiple bearing ewes in the flock need better nutrition. Failure to provide this may result in unsatisfactory losses of pre lambing ewes and broader effects, including reduction in the ease of lambing, milk production and resistance to infection.

Nutrition as recommended in Table 1 will help to eliminate the problem. Prevention is cheaper and easier to manage.

**Lamb loss**

Research has shown that typically 30% of all lamb losses occur during lambing or in the first week of life. There are many reasons why lambs die during the process of birth and a few days after lambing. The importance of each reason can vary from year to year. Table 3 shows the causes of lamb loss and what can be done to reduce them. The table shows that lamb losses can be reduced by management procedures that reduce the effects of weather, control predators and ensure adequate nutrition for the pregnant and lambing ewe.

Lamb losses are additive so that a low loss/high survival outcome is the result of managing the whole breeding system and not only one of the parts. This begins with mating, which sets the number of lambs to be born, continues through pregnancy to present a fit ewe at lambing and finally the selection and management of the lambing paddock. A common feature in lamb loss profiles is that both heavy and light weight lambs tend to perish, which is mostly due to management. Fortunately the number of lambs in these weight classes is generally low.

Starvation is a significant cause of lamb death and is frequently linked with mismothering.

If no injury has occurred during birth, starvation and mismothering is probably caused by poor quality ewe nutrition at lambing. This causes delayed onset of milk production for up to four hours. This delay is most common in twin-bearing ewes and often results in one lamb being orphaned.

Lambing supervision procedures, pirating, and blocked/poor teats are among the list of other causes of starvation and mismothering.

Lamb losses from exposure do occur and are usually caused by hyperthermia (high temperatures) or hypothermia (low temperatures). Hyperthermia is associated with high ambient temperatures leading to dehydration, whereas hypothermia usually follows several hours of low temperatures brought about by wind of more than 3 km/h and rain with perhaps a wet birth coat. Maternal hyperthermia has been demonstrated in Queensland where ambient temperatures reach over 36ºC and shade is limited. The effect is reduced lamb birth weight and consequently survival.

**Table 10.3: Sources of lamb loss at or just after lambing. Source: Shands, (2007).**

<table>
<thead>
<tr>
<th>Loss category</th>
<th>Cause</th>
<th>Key areas to address</th>
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<tbody>
<tr>
<td>Birth injury/still-born</td>
<td>Brain bruising* - Dystocia, malpresentation, prolonged labour</td>
<td>Ewe fat score</td>
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<td>Rough handling</td>
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<tr>
<td>Starvation/mis-mothering</td>
<td>Delayed/poor lactation</td>
<td>Poor teats/udder</td>
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<td></td>
<td>Pirating</td>
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<td></td>
<td></td>
<td>Forage quality</td>
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<td></td>
<td></td>
<td>Inspection procedures</td>
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<td>Supplementation techniques</td>
<td></td>
<td>Ewe density</td>
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<tr>
<td>Primary predation</td>
<td>Attack by birds, dogs, foxes or pigs</td>
<td>Identify predator</td>
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<tr>
<td></td>
<td></td>
<td>Develop a control program</td>
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<td></td>
<td></td>
<td>Strategic baiting</td>
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<td></td>
<td></td>
<td>Synchronise lambing with neighbours</td>
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<tr>
<td></td>
<td></td>
<td>Selection of lambing paddock</td>
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<tr>
<td>Exposure, hypothermia</td>
<td>Chill/cold, stress</td>
<td>Choice of lambing paddock</td>
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<tr>
<td></td>
<td></td>
<td>Reduce wind speed through</td>
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<tr>
<td></td>
<td></td>
<td>Shelter – strategic wind breaks, perennial grasses</td>
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<td></td>
<td></td>
<td>Topography</td>
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<td></td>
<td></td>
<td>Fencing</td>
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</table>

* haemorrhage in the cranial and spinal membranes
Birth trauma
In birth the foetus is propelled through the cervix and vagina by muscular contractions of the uterus. For a rapid birth the previously closed cervix needs to be dilated and lubricated. Trouble can arise when the complex interplay of hormones is not in sequence and the contractions continue without a fully dilated cervix. This results in bruising of the head and neck and in some cases suffocation of the lamb.

The effects of such trauma can be seen at post mortem where there is bruising damage of various degrees to the brain and spinal cord. The cause of this source of death is not known but it is recognised that lambs from fat ewes are more likely to die this way.

In a good season, difficult births are significant, and in the past it may have been attributed to ‘big’ lambs. It is now known that the fat ewe is the problem, with dead lambs from fat ewes having more spinal cord injuries than lambs from leaner ewes.

Colostrum
The first milk found in the udder after lambing is called colostrum. It is full of immunoglobulins that protect the lambs from infection during the first few weeks of life and provide a quick source of energy for the lamb soon after birth.

Initially it is a thick, opaque liquid that is difficult to express from the udder. As lambing proceeds, the colostrum changes colour from yellow to cream to white, and its viscosity from thick to a liquid similar to milk.

The production and characteristics of the colostrum depend on the feed quality for the ten days prior to lambing, irrespective of fat score. Poor quality feed in the ten days prior to lambing tends to reduce colostrum production.

Ewes in fat score two or lower tend to produce colostrum that is thick, which makes it difficult for the lamb to suck. This is particularly important if these low fat score ewes are twin-bearing because they are under nutritional stress and will have two lambs competing for a small amount of milk. This is a common cause of starvation/mismothering in one lamb from a set of twin lambs.

Good nutrition just prior to lambing will both increase the amount of colostrum produced and make it runnier, which will assist the lamb to extract it from the udder and increase lamb survival.

Lamb predation
Predator control is about identifying the predator and recognising what steps should be taken prior to lambing to eliminating the predator.

Common predators include eagles, pigs, crows, foxes and dogs. Lamb losses range from individual animals to a large proportion of the drop.

Often the losses are not immediately apparent and for this reason pre-emptive action is recommended. This may involve:

- Changing the lambing paddock;
- Electrically fencing the lambing paddock;
- Altering time of lambing;
- Trapping;
- Poisoning;
- Guard animals;
- Providing alternative feed for the predators; or
- A combination of all these options.

Foxes are a common predator.
Predation can be either primary, where the predator attacks a healthy animal that would have survived if not attacked, or secondary, where the lamb was either in a weakened state (eg a deserted lamb) or already dead prior to attack (eg dead at birth).

On average, over 15% of lambs will die naturally in a flock and these lambs are candidates for secondary predation. The trouble is that the sheep producer recognises predation but is usually unaware that it is of a secondary nature.

Healthy foxes are rarely aggressive and are opportunistic scavengers.

Their diet includes rabbit, carrion, lamb, mice, insects, plants, berries, birds, lizards and other non-vertebrates, but placenta when available is not always eaten. This food supply will vary with season and may influence the need for a fox to become a primary predator.

Primary predation is an important area of lamb loss but not necessarily in every flock and every year. Predator control is about identifying the predator and recognising what steps should be taken prior to lambing to eliminating the predator. Community fox baiting programs are a good example.

**Ewe nutrition**

Post lambing nutrition is important if lambs are to reach satisfactory weaning weights with the peak of the ewe’s lactation occurring about 30 days after lambing. Ewes normally metabolise their body fat for milk production and the amount of weight they loose during lactation will depend on the availability of quality pasture. Table 4 illustrates the minimum quantities of green pasture for twin and single rearing ewes one month after lambing.

<table>
<thead>
<tr>
<th>Ewes</th>
<th>Kg DM Green/ha</th>
<th>Lamb growth (g/d)</th>
<th>Ewe growth (g/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single rearing</td>
<td>1,000</td>
<td>180</td>
<td>-70</td>
</tr>
<tr>
<td>Twin rearing</td>
<td>1,500</td>
<td>140</td>
<td>-110</td>
</tr>
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</table>

**Supplements**

If supplements are to be fed through lambing it necessary to commence training ewes onto feed three weeks prior to lambing. Supplements will be needed to ensure ewes are accustomed to the feed. Locate the feeding site so that it can be seen from all parts of the lambing paddock and feed in the early afternoon as this will cause the least disturbance.

**Lambing on forage crops such as oats/barley/winter wheat**

When ewes are lamb on these grazing crops, birth weights are normal but in many cases a proportion of the ewes have to be assisted to lamb. This assistance usually only involves gentle traction.

It is not known what the cause is but the low dry matter (approx 25% DM) of these crops, together with the normal reduced pre-lambing intake, is the likely cause. Lambs, dry sheep and ewes in early pregnancy exhibit excellent growth rates when grazing these crops. If it were necessary to lamb on a forage crop it may be an advantage to supplement with a grain ration in the last two weeks of pregnancy. Adding 1% of limestone to the grain will reduce the risk of calcium deficiency. Crops above 30 cm in height may lead to mismothering, especially in highly fecund ewes.

**Lambing management**

Ewes with multiples should be given priority for shelter, supplements and quality forage, and need to be in their lambing paddock about one week prior to lambing.

Single bearing ewes only need to go into lambing paddocks when the first lamb arrives. If no scanning data is available then put lambing ewes together but meet the requirements of the multiples.
See Table 4 for the recommended pasture levels in the lambing paddock. Lambing paddocks ideally have effective shelter that reduces winter wind speed to less than 8 km/h at lamb height, which is equal to a slight breeze. This is best achieved by:

- A northerly aspect, which protects stock from cold southern or westerly winds;
- Strategic windbreaks of trees and perennial grasses;
- Topography; and
- Fencing.

Night campsites also need to be well drained, have good shelter and water as well as aspect (fence off poor shelter such as the top of the hill). The winter campsite is often characterised as being well drained, elevated, and positioned where the sun hits first in the morning (in the NE corner).

Forage in lambing paddocks should be consistent with Table 4. If this is inadequate then a supplement should be provided. Supplements can be fed every second day between 2pm and 4pm, with feeding sites visible and accessible from all sections of the paddock.

If it is necessary for paddock inspections to be carried out these should be done between 2pm and 4pm when it is warmer and the social behaviour of the ewes and lambs is relaxed.

Mob size for lambing should be:

- Multiple bearing ewes: < 250 ewes
- Single bearing ewes: 400–500 ewes
- Maiden ewes: 250–400 ewes

A ewe density of less than 18 ewes/ha is recommended but ewes also need room at the sheep camp to spread out.

Readings

The following reading is available on CD.


Activities

Multi-Choice Questions

Submit answers via WebCT

Useful Web Links

Available on WebCT

Assignment Questions

Choose ONE question from ONE of the topics as your assignment. Short answer questions appear on WebCT. Submit your answer via WebCT
Summary

Summary Slides are available on CD

Pregnancy

Check ewes are at target fat score three by day 100.

- Scan ewes for multiples about 100 days after the start of joining.
- Draft ewes into mobs on scanned information and manage accordingly.
- Avoid major changes in the nutrition of the ewe during pregnancy.
- Ewes of fat scores four and five need to be managed so they reduce at least half a fat score between day 90 and 118.
- Restrict nutrition in mid pregnancy if fat score needs controlling.
- Supplement as necessary.
- Vaccinate four to six weeks pre lambing.
- Control predators if necessary.

Lambing

- Ewes with multiples should get priority for paddocks with the best shelter and quality feed.
- Put ewes with multiples into lambing paddock one week prior to commencement of lambing.
- Put single-bearing ewes into lambing paddock after the first lamb is born.
- Mob size for lambing should be:
  - Multiple bearing ewes < 250 ewes
  - Single bearing ewes 400–500 ewes
  - Maiden ewes 250–400 ewes.
- Supplement ewes if feed is below 1,500 kg DM/ha (green).
- Feed supplements between 2pm and 4pm.
- Identify causes of lamb losses.

References


Dunstan, M., 2005. 'Pasture tools for a profitable sheep enterprise.' Department of Primary Industries, Victoria. ISBA: 1740366468.

Glossary of terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Fat score</td>
<td>The amount of tissue manually palpated over the 12 rib, 110mm down from the middle of the back bone</td>
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<tr>
<td>Ultra sound scanning/ real time scanning</td>
<td>The identification of dry, single or multiple bearing ewes</td>
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<tr>
<td>Predation</td>
<td>The taking or killing of live or dead lamb</td>
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<tr>
<td>Colostrum</td>
<td>Thick, milk like secretion from the udder for newly born lambs containing immunoglobulins</td>
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<tr>
<td>Fodder crops</td>
<td>Crops specifically planted to provide feed at strategic times of the year</td>
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<tr>
<td>Supplements</td>
<td>The strategic feeding of grain or hay</td>
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