



Birth injury and foetal distress in lambs

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Dystocia, birth trauma and foetal distress contribute substantially to neonatal lamb mortality. Australian post-mortem studies often find dystocia is a factor in ~50% of lamb deaths. It is also a common cause of death in ewes.

Dystocia means a slow or difficult labour and/or delivery. There are numerous causes and it is often multifactorial. Hence prevalence varies within mobs, between farms and across years. Treatment can be rewarding, depending on the speed of intervention and the type of dystocia. Management strategies must target the root cause.

This article discusses the importance of dystocia, describes how to recognise when there's a problem and the types of dystocia and how to attend to the ewe.

Normal birth

Ewe gestation is between 143-147 days but may be 1-2 days shorter in multiple bearing ewes. Impending birth is indicated by udder development, colostrum build-up and pelvic ligament laxity resulting in the ewe waddling.

Normal birth involves three progressive stages that should each occur within a certain timeframe. Failure to progress to the next stage, or a delay in any stage, results in dystocia. The components of each stage, and recommendations for when to intervene are found in Table 1. Patience is advised before intervening, lest the attempt to assist worsens the situation, especially with first lambing ewes as they often take longer to progress.

Why worry about dystocia?

Abnormalities in labour and delivery result in foetal distress and trauma, sufficient to kill both lambs and ewes. Ewe death may occur during dystocia due to shock, uterine rupture, haemorrhage and metabolic disease. Foetal death may occur before or during the second stage of labour due to oxygen deprivation e.g. cord compression or trauma e.g. ruptured livers.

If not immediately fatal, oxygen deprivation causes brain injury that subdues the lamb. These lambs are more susceptible to predation and starvation-exposure-mismothering (SEM). Indeed, analysis of 4 years of post-mortems from one property revealed that dystocia contributed to 48% of neonatal lamb deaths. Of these, 27% died from birth injury related SEM or predation.

Complications from dystocia also increase ewe mortality and decrease production. For example, bladder rupture, severe infection, metabolic disease and nerve compression can result in delayed deaths or subsequent euthanasia. Following dystocia, milk production may fall, and future fertility may be compromised.

Thus, the impact of dystocia on production stems not only from immediate ewe and lamb deaths, but from the increased risk of other causes of neonatal lamb mortality and decreased ewe reproductive output. A 2015 cost of disease analysis found that dystocia was the third most costly disease (\$219 million per annum), contributing significantly to the most costly disease, neonatal lamb mortality (\$540 million per annum).

There are also important welfare concerns around dystocia, emphasising the importance of reducing risk where possible and increasing the monitoring of high risk ewes to enable early intervention and improve outcomes.

Table 1: Normal labour and delivery in ewes

| Stage | Phase of labour or delivery | Duration | When to intervene |
|-------|---|-------------------------------|--|
| 1 | Behavioural change, ligament relaxation, contractions start, cervix dilates | 3-6 hours (up to 12) | Failure to progress to stage 2 (>6 hours) |
| 2 | Water bags burst (first allantochorion then amnion) and fetus(es) expelled (normal: front feet & head) ¹ | Within 1-2 hours ² | 4 hours from membranes visible, >1-hour intense straining with no lamb, lamb visible >30 min but no change or malpresented, malodorous discharge |
| 3 | Placenta & membranes expelled, ewe-lamb bond | 2-3 hours | Within 6 hours ³ |

¹delayed rupture of amnion may asphyxiate lamb, common in multiples; ²interval between lambs in sets of multiples varies from 10-60 minutes; ³often not observed in extensive systems



Causes of dystocia

There are two broad categories of dystocia. The first involves complete dilation of the cervix, but either the foetus(es) cannot 'fit' out or the uterine contractions are insufficient to birth the foetus(es). The second occurs with incomplete dilation of the cervix. To help understand the specific causes of the former, consider litter size and lamb birthweight (Fig 1). For example, both excess nutrition and large terminal sire rams over ewes pregnant with 1 foetus can result in high-birthweight dystocia (termed foeto-pelvic disproportion). Low-birthweight foetuses may result in malpresentation dystocia in triplet ewes.

Risk factors for dystocia

A recently published paper reported risk factors associated with birth difficulties over 44,022 lambings in 8 Australian Merino and crossbred flocks (Horton et al. 2018). Important risk factors include:

- **Lamb birthweight:** both high and low birthweight increases dystocia risk. Risk is minimised at 4.8 kg (Brown et al 2014)
- **Litter size:** risk increases with litter size. 40% of ewes ≥ 4 years old with triplets had low-birthweight dystocia (Horton et al. 2018)
- **Ewe liveweight and condition score (CS):** both very fat ewes (due to pelvic canal and abdominal fat) and malnourished ewes are at risk.
Mating weight and CS: higher weight relative to mob average increases litter size thus dystocia.
Early pregnancy: heavier ewes at risk of high-birthweight dystocia
Weight throughout pregnancy: heavier ewes have a higher risk of low-birthweight dystocia.
- **Breed and sire:** increased foeto-pelvic disproportion in some breeds
- **Age of dam:** low risk of dystocia for first lambing ewes with 1 lamb (<1%) but up to 5% in third lambing ewes (4 yo) (NB: adjustment for birthweight decreases this relationship)
- **Ewe disease** e.g. hypocalcaemia, pregnancy toxaemia
- **Lambing history:** prior dystocia is a risk for future dystocia
- Pasture toxicity e.g. clover disease

When to suspect dystocia

Dystocia is not always obvious. Signs indicating investigation and the reasons justifying intervention include:

- Foul smelling discharge from vulva (dead foetus(es) &/or infection) → improve chance of ewe recovery
NB: a dark, odourless discharge for three weeks post-lambing is normal
- Obvious malpresentation or stuck lamb e.g. 2 heads or 1 swollen head → improve ewe recovery and check for other live lambs
- Long stage 1 with no progress, long stage 2 or straining stops (Table 1) → chance of live lamb and ewe
- Late pregnant ewe unable to rise
- Dead ewe or lamb with signs of dystocia e.g. ewe with stuck lamb, meconium stained lamb

As discussed, dystocia results in foetal distress. This triggers the foetus to pass meconium, the first faeces. The wool is stained bright yellow if this occurs *in utero* or during birth. It is an obvious indicator of prior stress.

There are other important causes of foetal distress resulting in meconium e.g. foetal need exceeds placental development, pregnancy toxemia and infection. Again, surviving lambs are at increased risk of neonatal lamb mortality due to predation and SEM. Cases of *in utero* foetal distress not due to dystocia are hard to differentiate from cases of dystocia. Contact Mackinnon if concerned about yellow stained lambs.

Diagnosis of dystocia

Diagnosis requires both external and internal examination of the live ewe, or post-mortem examination of ewes and lambs. A suite of lamb post-mortems will reveal the contribution of each type of dystocia e.g. malpresentation or foeto-pelvic disproportion with visible swelling, oxygen deprivation *in utero* or dystocia contributing to SEM.

Treatment

Equipment: Useful equipment includes:

- Full length calving gloves: personal protective equipment essential for the assistant's and the ewe's health
- Obstetric lubricant
- Disinfectant solution
- Lambing ropes
- Towel
- '4 in 1' injectable solution and oral propylene glycol for ewe
- Antibiotics and anti-inflammatories (as prescribed)

Approach: Gentle, timely intervention increases success, as do hygiene and care. Trauma to the reproductive tract greatly increases the risk of infections.

A detailed description of the approach to dystocia is beyond this article (contact Mackinnon for more detail). Briefly, wearing calving gloves and with abundant lubrication, carefully examine the ewe to assess the cervix, foetal presentation, presence of life and the number of foetuses.

If only 2-3 fingers fit through the cervix, either the ewe is still in early labour (leave her undisturbed for labour to proceed) or dilation is problematic (ring womb). A cervix with ring womb will not dilate with manipulation, and a caesarean is indicated. If this is not possible, humane euthanasia is required.

If lamb body parts are protruding or are felt, carefully identify whether they belong to the one lamb. If so, correct the presentation with abundant lubrication and care, using lambing ropes where required and applying gentle traction.

If multiple lambs, distinguish each lamb by feeling from the foot up, over the neck or rump, down the other limb.

After assisting a dystocia, always

- **Check the ewe for more lambs**
- **Attend to the lamb:** clear nose and rub with a towel. Put with the ewe to bond. A pen may be needed

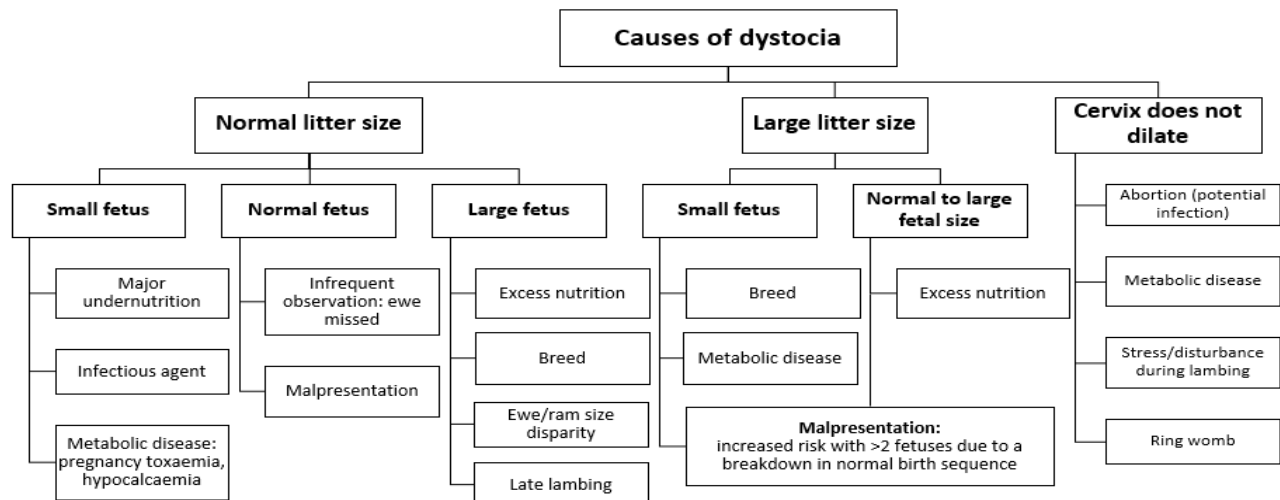


Figure 1: Common causes of dystocia (adapted from Hindson & Winter 2008). Congenital malformation can also result in dystocia.



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- **Treat the ewe:** ewes may require calcium, antibiotics, pain relief and anti-inflammatories (prescription only, use according to labels)
- **Assess ewe's prognosis:** consider her risk of being a 'downer' (refer to June 2017 Newsletter) and her mentation (dull ewes have poorer prognoses than bright ewes)

If the dystocia is not easily resolved, seek veterinary assistance or humanely euthanase the ewe. Avoid excessive force or traction. An epidural by a vet will block contractions, ease correction and increase success and welfare.

Complications of dystocia

Down ewe: ewe unable to rise due to disease, muscle and nerve damage (refer to June 2017 Mackinnon Newsletter).

Overwhelming bacterial infection: e.g. uterine infection of the ewe associated with intervention or a dead foetus

Uterine rupture: may follow forceful intervention or breech presentation and result in death. Reduce by gentle, early and well lubricated intervention

Bladder rupture: due to obstruction of the urethral opening by a foetus, preventing bladder emptying. Ewes may survive days before dying.

Spontaneous vaginal wall rupture with intestinal evisceration: heavily pregnant ewes for no obvious reason. Risk factors include excess body condition, triplet plus pregnancies and high fibre diets. Ewes should be humanely euthanised.

Risk reduction

The options for reducing dystocia involve addressing the aforementioned risk factors. Three key strategies are:

1. **Appropriate nutrition:** meet the requirements of the ewe at any given stage of gestation, avoiding feast to famine, or famine to feast
2. **Ram selection** especially for terminal sires and specific breeds
3. **Monitoring based on risk:** great care with older ewes with triplets (balance with over-supervision).

Conclusion

Reducing dystocia provides an excellent opportunity to decrease neonatal lamb and ewe mortality. Predicting dystocia is difficult, but very high-risk ewes can be identified e.g. triplet ewes ≥ 4 years old. As they are often a small proportion of the flock, close monitoring and early intervention is possible, with positive outcomes for survival and welfare.

Key points:

- *Stillbirths due to dystocia are the tip of the iceberg of the impact of dystocia on ewe and lamb mortality*
- *Birth injury increases the risk of neonatal mortality from starvation-exposure mismothering & predation*
- *Gentle, well lubricated help improves outcomes*
- *If you are concerned about dystocia in your ewes, contact a Mackinnon Project veterinary consultant to investigate and develop a management plan*