Understanding animal behaviour provides an enormous advantage for farmers. Taking a moment to consider the process of animal domestication can provide a deeper understanding of alpacas. Horses, cattle and sheep have evolved over many centuries to be domesticated species. As part of the domestication process, desirable traits in each of these species have been selected with the purpose of making them more suitable to human needs. Tolerance to human contact and temperament are important traits that are characteristics of domesticated species. The success of this selection is no more evident in the more domesticated species like cats, dogs and horses and less so in terms of the less intensively managed species such as ruminants and pigs. The natural ‘fright and flight’ reflex of undomesticated species is so important for survival in the wild. Where animals are frightened the natural tendency is to flee. This innate response is still present in South American Camelids (SACs) when compared to domestic animals. So what does this mean? The SAC’s like wild animals do not express overt signs of disease that are typically seen in other domesticated species because, in the wild, these signs make the animals a target for predators. Instead they tend to mask signs of disease as a protective mechanism. In terms of parturition (birthing) early signs may be well hidden with animals being able to turn on and off the early signs of stage one labour in response to environmental conditions.

The Normal Birth

Gestational length in alpacas ranges from 335-360 days. Parturition in the alpaca is initiated by changes in circulating hormones and is divided into three stages as in other species. Stage one may take two to six hours and begins with relaxation of the cervix and uterine contractions which position the foetus at the birth canal. Stage two is expulsion of the foetus. This usually occurs in the morning with the dam in a standing position and, based on studies, should be completed in 8-25 minutes. Stage three is the expulsion of foetal membranes and should be completed in three to four hours but may be longer in alpacas having their first cria.

Imminent parturition in the alpaca can be difficult to predict and signs consistent with impending parturition are often unreliable, particularly in first cria dams. Accurate breeding dates can be of assistance. Invariably, with most large animal species, the duration of pregnancy is very similar from year to year so recording the period of gestation (pregnancy) each year will provide valuable information about the due date for the following mating.

Dystocia is defined as prolonged or difficult parturition. The prevalence of dystocia in SAC is reported to be 1.6-10% and lower than reported in other domestic ruminants. Maiden females (females having their first cria) make up only 25% of the dystocias seen in alpacas, in contrast to many other domestic species where it is most common in primiparous (first pregnancy) females. Malpositioning of the foetus caused by the long neck and legs of the cria or a failure of parturition to progress are common causes of dystocia. However there is little information on dystocia in this species.

Our experience is that malpositioning of the cria or malpresentation (breech presentation) are the most common causes. The cervix is more susceptible to damage in SAC than other domestic species and damage to the cervix can lead to subsequent infertility. Furthermore prolonged manipulation carries the risk of injury to the dam, death of the foetus, and increased risk of postpartum metritis. With this species professional assistance from a veterinarian who has extensive experience in manipulation of the foetus is valuable. Owners trying to pull a malpositioned foetus can cause severe if not life threatening damage to the cria and dam. An experienced will make the manipulation procedure look easy and increase the likelihood of a live foetus.

In my experience, a failure of the dam to progress with labour is the second most common complication. This often affects maiden females but may occur in multiparous (females that have had more than one female). These females often separate from the herd, sit quietly, sometimes vocalising, and sometimes showing signs of mild abdominal pain. Vaginal palpation often reveals a partially dilated cervix and the intact membranes can be felt within the cervix. Opening the membranes and attempting to pull these crias...
may lead to cervical damage and these females are candidates for a caesarean. In our experience where the dam is found and presented within 24 hours there is a high likelihood of a live foetus.

Where the foetus cannot be delivered without undue risk to the dam or the cria or the cervix is not completely dilated and risks damage, caesarean section can be performed. It is prudent to set a strict time limit to manipulation of the foetus. It is all too common that manipulation is unintentionally prolonged compromising the delivery of a live cria and salvaging a reproductively sound dam. Caesarean should be considered a very effective treatment option. We perform caesarean under general anaesthesia through the ventral abdomen. This approach is associated with fewer complications and females will go on to breed and deliver subsequent crias normally. Paralumbar approaches may be more cost effective but are stressful on the dam, have higher risks of complications and are likely to be associated with a less favourable prognosis for future breeding soundness.

Retention of the placenta is not common in the female. Placentation is diffuse similar to the horse however retained placenta is not associated with the severe complications seen in the horse so it is not an emergency. Administration of oxytocin can facilitate contraction of the uterus and repulsion of the placenta. Where the placenta is retained for several days gentle traction can help remove the remaining placenta but care should be taken to avoid tearing the placenta and leaving some intact and avoid fresh bleeding which can indicate damage to the uterus associated with tearing of the attachment. Antimicrobials are indicated if the placenta is retained for more than a few days, if the dam is showing systemic signs of illness or the placenta and discharge becomes foul smelling.

The Cria

Generally the newborn is between 8-14kg. Higher birth weights in this country compared to Peru are probably associated with the females being in better condition. Generally gestation length in females is similar from year to year so keeping records on breeding dates and birthing dates are useful so the owner can be aware of impending births. Dysmature crias do occur: These crias may be born during the suggested time for normal gestation however may not, for a variety of reasons undergo their full development inside the uterus. Generally these crias have lower birth weights, un-erupted incisors, floppy ears and a silky coat. They are often weak and find it difficult to stand and nurse.

Allowing females to give birth in a clean safe environment will reduce the incidence of perinatal disease and death. Females prefer to give birth without being watched by overly concerned owners and are less likely to have complications. Having breeding females close to the house or general working area where they can be safely watched from a distance is ideal. Intervention should be restricted to those females showing signs of having difficulty.

Crias have a poorly developed immune system and rely on transfer of immunity in the colostrum or mothers milk. This transfer must occur within the first 24 hours and preferably in the first 8-12 hours. After this time the ability of the intestine to absorb large proteins diminishes. There are a number of tests that can be performed to assess the efficacy of this transfer however in this country simply doing a serum protein reading on a refractometer which most veterinary practices have on site will provide a reasonable measure of colostrums absorption. The importance of colostrum to provide immunity for the first three months until the neonatal immune system develops should not be underestimated. However it has been established that crias that have good colostral transfer and are exposed to unclean environments are susceptible disease and those that do not get good transfer and are kept in clean environments may survive quite comfortably. So the importance of providing hygienic and clean paddocks for birth and the neonatal period should not be underestimated.

Crias with insufficient colostral intake can be supplemented with plasma. There is commercially available alpaca plasma available in Australia. This is ideally given intravenously through a catheter although some veterinarians prefer to give this into the peritoneum. Injecting plasma into the peritoneum may have a higher risk of damage to one of the internal organs. Where plasma is not available some veterinarians will collect blood from the dam. In horses blood will settle out from the plasma overnight making it easy to harvest the whole plasma. In alpacas this does not occur and blood will take days to settle. Some veterinarians will have access to a centrifuge and can spin the blood down. However where we have elected to bleed the dam we normally place a catheter into the cria and give 50ml of whole blood then hang the bag of blood in the fridge administering 25ml of blood twice daily. As the bag hangs and the blood cells settle to the bottom of the bag it is possible to harvest the supernatant which contains more plasma than blood cells. This is continued until the total plasma protein concentrations increase in a blood sample taken from the cria.

Young crias should be observed in the first 24 hour for any congenital abnormalities. Presence of an anus should be established and the meconium or first faeces should be passed. If the cria is constipated dog enemas are available and can be administered. Evidence of milk in the nose may indicate a cleft palate. Signs of diarrhoea or difficulties breathing could indicate a problem and should be investigated by a veterinarian. Crias should be kept in a clean environment with the remainder of the herd and protected from predators.

Vaccination and worming remain controversial. Vaccination of the pregnant females one month prior to giving birth is
likely to be the most effective way of transferring some immunity to the crias. Five in one or seven in one vaccines are available. It is unclear how effective these vaccines are in alpacas in establishing immunity. In healthy herds vaccinating the young at three months and at three monthly intervals for the first year of life and then every 6-12 months is probably a reasonable approach.

The intestinal worms affecting alpacas are those that affect our domestic species of ruminants and these are generally susceptible to the commercially available worming medications. Good pasture management and rotating and spellings pastures go a long way to controlling intestinal parasites. In healthy adults intestinal parasites do not appear to cause significant problems. This may be related to a resistance but also to the habits of alpacas to defaecate in the dung pile away from where they are fed and graze reducing exposure to the work larvae. Where there are high stocking rates, poor pasture rotation and overgrazing worms may become more of an issue. Worms are opportunistic and will have an impact on animals with concurrent disease. An exception to these rules is the ‘Barbers poll worm’ or Haemonchus contortus. These have been several severe outbreaks in regional areas killing multiple animals. These are heavy blood sucking intestinal parasites and can lead to severe untreatable anemias that lead to death. The adaptive ability of alpacas to adjust to high altitude is associated with a unique ability of their red blood cells to deliver oxygen to tissues. So animals with blood counts so low that they would be associated with death in other species can show very few signs of disease. Haemonchus also has developed resistance to many of the anthelminthics available. We generally suggest worming crias at three months then at six and 12 months in heavily stocked properties. Where worms are not a problem pasture rotation and worming strategically every six months should be sufficient. Where Haemonchus is a problem a program for management and appropriate anthelminthics should be discussed with your veterinarian.

Young crias that are dysmature or are weak at birth and are not nursing need early intervention. We have found that these crias can survive on short term energy reserves and appear quite bright for about 24 hours. This can provide a false sense of security to owners. If these crias are not nursing adequately and do not receive appropriate nutrition, they invariably have poorly developed organ function and will suddenly go from appearing to be relatively normal to collapse into a semi-comatose condition. On most occasions treatment at this time is usually unsuccessful. Early intervention to provide nutritional support for these crias until they are able to fend for themselves is usually successful.

Many owners will try and provide support for weak or dysmature crias to avoid the costs of veterinary treatment. Crias require at least 100ml/kg body weight (800-1600ml) of fluid and an energy source in the first 24 hours. Where organs such as the intestinal tract are not fully mature administering this volume orally may overload the cria. If the cria is not readily prepared to drink this volume or administration of this volume is not achievable at home veterinary assistance is warranted.

Use of prophylactic antibiotics is usually not recommended for routine birth and is not an excuse for poor management. Antibiotics should be reserved for sick animals. There are no drugs licensed for use in alpacas so owners should be aware drugs are used off label. This does not mean the drugs are not useful or effective, only that much of the use of drugs in alpacas is based on experience rather than documented evidence in this species. Appropriate antibiotics for use in alpacas particularly crias is unknown. It is best to use routes of administration and antibiotics that are the simplest and most reliable across species. While intramuscular and subcutaneous administration is convenient it provides less reliable and lower concentrations of antibiotics than intravenous approaches. Oral antimicrobials potentially can cause diarrhoea and absorption may be variable. Placement of an intravenous catheter is simple and practical and also provides a route for administration of intravenous fluids if required. Antimicrobials such as Ceftiofur or Pencillins combined with Gentamicin are appropriate and doses used in other species appear to be effective.

In crias that require milk supplementation or in orphan crias, we usually use Divetalact which is a commercial milk replacer appropriate for crias. There are other milk replacers on the market but we have generally found Divetalact useful across species. We calculate the daily fluid requirement (100ml/kg body weight) and ensure the cria gets at least that volume each day. Where crias are clearly dysmature or unwell we make up a half strength solution of Divetalact to avoid overloading the intestinal tract. Ensuring the cria is taking in the volume of fluid rather than the concentration is most important so they do not dehydrate. Where the cria is not nursing well and is not taking sufficient volume of fluid then veterinary attention to provide a feeding tube or supplement the fluid volume through intravenous fluids will be required. Where the cria is taking in sufficient fluid and tolerating the milk replacer then the concentration of the milk replacer can be increased after 12-24 hours. Milk replacers should be made up to their specifications and should not be made super concentrated. There seems to be little information on how much a cria should take in milk replacer daily however somewhere between 10-20% of body weight is acceptable. Most healthy crias will regulate their own intake.

Careful observation and minimizing unnecessary intervention is the key to successful management of the periparturient alpacas and the newborn cria. Where there is evidence of the need for intervention, engaging an experienced veterinarian early in the process may prevent costly treatment or death. In pregnant females and crias, once there are overt signs of a problem clinical complications may progress rapidly. Owners who wish to provide supportive treatment from home should set realistic time limits, after which time, if there is no appreciable improvement, a suitably experienced veterinarian should be contacted. Good management practices are very effective in preventing stock loss.