



CAMELID HUSBANDRY AND COMMON VETERINARY PROBLEMS

Alpacas and llamas are increasingly popular as quality fleece production animals and pets. Larkmead Veterinary Group provides veterinary care to both pet owners and a number of well-established, high-quality breeding farms. Many of the problems we see are the result of common and often preventable disorders. The aim of this factsheet is to outline some of the basics of camelid husbandry and hopefully minimise the occurrence of the more common disorders. As a practice, we deal mainly with alpacas, so most of the information below relates directly to them. However, much of the husbandry advice will also be applicable to llamas.

The alpaca originated from South America in the arid, high altitude Andean Planes (Altiplano) and has obviously had to adapt to the wetter climate and lush pasture in the UK. This change of environment and an often high stocking density relative to the Andes has also influenced the type of problems we see in this species.

Learning what is normal

It is good animal husbandry to regularly handle your alpaca or llama from "head to toe". This allows you to learn the textures and bone structures that are present in the normal animal. This will help to train the animal to be held and handled, aiding us if ever we have to examine the animal as a patient. More importantly it allows you to detect deviations from the normal early and thus seek advice early from vets or other experienced owners/breeders. As with most medical conditions, if addressed promptly there is a much better chance of a favourable outcome.

Reproduction

Females need to have begun the hormonal changes of puberty before they can be bred from. As a guide, female alpacas may be mated once they are over 12 months of age or weigh two-thirds of their anticipated adult weight – (i.e. when they have reached 40kg).

The gestation period (length of pregnancy) of the alpaca is approximately 11.5 months. However, the gestation period can be highly variable between individuals and it is not uncommon for an alpaca to have a gestation length of more than 12 months. Most animals are bred from spring until early autumn, so that the cria are born the following year during the more favourable climate of the English summer!

Female alpacas are induced ovulators. This means the egg is only released from the ovary after mating with a male. After giving birth they undergo extremely quick uterus involution (returning of the uterus to normal size) and are capable of successfully re-breeding as early as 10 days after calving. As a general rule it would be recommended to wait at least 15 days after a straightforward calving before breeding again.

Pasture breeding (i.e. running a male with a group of females) and strictly managed hand breeding (i.e. one female with one male, possibly aided by the handler) are both used as methods of breeding females. The latter gives control over mating date and pairing and a more reliable indication of conception date.

"Spitting-off" is an indirect method of pregnancy diagnosis based on the behavioural manifestation of the high levels of the hormone progesterone that are produced during pregnancy and make the female animal unreceptive to the male. It is this which causes the female to regurgitate stomach contents and spit it at the male in rejection. Three positive "spit-offs" a week apart, beginning a

week after the mating, are a good sign that the mating has held. The theory is that the first spit-off tells you the female has ovulated, the second she has conceived and the third she has held. If the female sits to be mated when introduced to a male then it is likely that they are not pregnant (a negative "spit off").

Ultrasound scanning of the abdomen after 30 days is a useful tool to help decide whether an animal is pregnant or not. However, it must be borne in mind that up until 60 days of pregnancy there is a high re-absorption rate in these animals (10-20%), so later pregnancy checking with spitting-off and/or ultrasound is often useful. The optimum time for scanning efficiently is 60-90 days.

Vaccines

Vaccination of alpacas is routinely undertaken, as with sheep, to protect against disease caused by species of Clostridium bacteria. The clostridial diseases that you may have heard of are: tetanus, botulism, pulpy kidney and blackleg. There are multi-strain vaccines such as Lambivac, Bravoxin 10 and Covexin 10, which provide protection against 4, 10 and 10 types of Clostridial disease respectively. Unfortunately, Heptavac, which many alpaca clients were using to protect against clostridial disease, is no longer being produced.

There are several possible vaccination protocols commonly used in alpacas and no one has yet proven a single best protocol. It is important to remember that there are no drugs or vaccines licensed for use in alpacas in the United Kingdom, so their use is based on veterinary recommendation, previous experience and small numbers of independent drug trials.

The most common regimes that we recommend are:

- Protocol 1 – using Bravoxin 10 or Covexin 10 alone (1ml dose)
 - All animals receive a primary course of 2 doses given 4-6 weeks apart. Start the course from 2-3 months of age, assuming that the cria came from a vaccinated mother and received sufficient colostrum.
 - Booster vaccinations are given every 6 months.
 - Aim to time vaccination such that a dose is given to pregnant females 4-6 weeks before calving. This will ensure that the maximum number of protective antibodies will be incorporated into the mother's colostrum (first milk), providing protection to the cria in its first few weeks of life. Care should be taken when handling animals in late pregnancy when the stress of handling and injecting itself may cause abortion or premature birth.
 - Be aware that this vaccine can commonly cause a sizeable swelling at the injection site which gradually resolves over a period of days or weeks.
- Protocol 2 – using Lambivac and Bravoxin/Covexin 10 (2ml Lambivac, 1ml Covexin10)
 - Lambivac is given to crias once they are 48 hours old and again at 2-3 weeks of age.
 - Bravoxin/Covexin 10 is given at 4-6 months old and again at 1 year old.
 - Animals are then boosted annually with Bravoxin/Covexin 10 (time the vaccination of the females so that is carried out once recovered from giving birth but before breeding)
 - Any bought-in adult animals will need to have 2 doses of Bravoxin/Covexin 10 given 4 – 6 weeks apart.

Castration

Castration (removal of the testicles) of males to create geldings is usually performed when they are 18 months old and thus have completed their juvenile growth. Removal of the testicles decreases testosterone production and so earlier castration can prolong the time the growth plates of the long bones remain open. This can result in relatively long-legged alpacas. Whilst there are no proven health implications, this appearance may be aesthetically unacceptable.

The procedure of castration can be undertaken by numerous methods from full anaesthesia and a sterile operation to using local anaesthetic to numb the area and an open castration technique.

At Larkmead we tend to perform an open castration under local anaesthetic, with or without additional sedation as required.

Care of the newborn cria

Newborn crias can be quite fragile creatures. Ideally mothers and their offspring should be left alone to bond as much as possible. However, early intervention is preferable if you have any concerns, such as a weak-looking cria, bad weather or a first-time mother not mothering her cria correctly.

Normal alpaca crias should weigh at least 5.5kg, but usually weigh 7-9kg at birth. They may lose up to 0.25kg in the first 24 hours of life but thereafter should gain 0.25-0.5kg daily. The navels of the cria should be dipped or sprayed with 2-3% iodine tincture to prevent navel infections and if calving inside then the mother and cria should be on clean straw bedding.

Crias should receive a good volume (250–500 ml) of colostrum (the female alpaca's first milk) in the first 8 hours of life. Overall, they should consume 10-20% of their bodyweight in the first 24 hours of life.

Ideally the colostrum should come from its own mother and most crias take to their mother's teat by instinct. Ensure that the cria learns how to suck milk from its mother, as some may need gentle persuasion and teaching. If the cria is not taking to its mother's teat always check for a reason why and consider speaking to your vet or an experienced owner. The mother should have functioning teats and an udder full of milk. The udder should not be hot, hard or painful. There is initially a small waxy plug in the teat ends and it can help to milk these out to allow an easy flow of milk for the cria. Lack of oxygen to the cria's brain during calving, leading to a 'dopey' cria, and hypothermia are common reasons why the cria may struggle to suckle.

In situations where the mother's milk is not sufficient, then the best substitute is goat colostrum. Cow colostrum can also be used. Colostrum is best stored frozen for emergency use and will keep for one year in the freezer. Colostrum should be carefully reheated by putting it in warm water. Do not microwave colostrum as this breaks down proteins (including protective antibodies). The colostrum is then fed via a bottle (if the cria will suckle) or by stomach tube (correctly placing these is something that can be learnt from your veterinary surgeon).

If for any reason you think a newborn cria has failed to take sufficient colostrum, then veterinary advice should be sought and consideration given to providing the cria with a plasma transfusion. Many large producers will hold a store of frozen plasma. The plasma is obtained by collecting blood from a donor adult (usually young healthy males) and removing the blood cells to leave behind nutrients and antibodies. This is a procedure we undertake commonly at Larkmead, so do contact us if you would like to discuss the possibility in more detail. We may also suggest testing the cria's blood to see whether it has absorbed sufficient maternal antibodies.

Hypothermia is a big problem in our wet environment. Unlike cattle and sheep, alpacas do not lick off the birthing fluids from their cria. This leaves them susceptible to catching a chill. We recommend that you use a clean towel to dry off the new cria, especially if the weather is inclement. A hair dryer can also be useful. In situations where you go out and find a cold, wet newborn cria in a field with a body temperature below normal (less than 37 Celsius) you should use a warm water bath to raise the cria's temperature and ring your vet as soon as possible.

Parasite control

Alpacas, unlike other grazing species such as sheep and cattle, do not achieve a long-lived immunity to parasites such as nematodes (worms) and coccidia. This may be an evolutionary outcome from the fact that they are used to a very expansive environment in the Andes with relatively low stocking density and therefore limited challenge from these parasites. Alpacas grazing near water sources or on boggy ground may also be at risk of exposure to liver fluke.

The following guidelines are aimed at eliminating, or at least minimising, parasitic disease, whilst also attempting to minimise the chance of the parasites becoming resistant to the drugs used to treat them. Each farm should have an individual parasite control plan tailored to their specific circumstances, including herd size, availability of grazing and previous history of disease.

The alpaca is most susceptible as a youngster when eating grass, but is also at risk as an adult. Alpaca owners often only have limited amounts of space available for their animals to graze and fields are grazed year-on-year, without time to rest. Therefore the build-up of worm eggs and larvae can be high and adults can succumb if the challenge is that great. The maximum recommended stocking density is 7 alpacas per acre.

Signs of weight loss, with or without diarrhoea and mucky backsides, are common presentations these parasitic diseases. If diarrhoea is present this will put the animal at risk of "fly strike", where maggots hatch out and start to eat away at the skin.

Faecal sampling is key in monitoring the parasite load on the farm, or within specific groups, and adjusting any parasite control plan accordingly. Ideally, routine monitoring should be carried out at least twice yearly, and preferably prior to any planned treatment. May and November are sensible times for this. If you have a large herd, choose ten animals, preferentially selecting younger or less healthy animals, or those that might otherwise not receive routine worming at that stage. Worming should not be a routine treatment throughout the summer, as is advocated by the old school of sheep farmers.

Clean grazing is a vital part of parasite management. Paddocks must have been rested for a least one year to be defined as clean grazing. The most at-risk animals will be crias and weanlings, so being able to move these animals onto clean grazing each year would be invaluable in reducing the parasite challenge to them. Pasture rotation on an annual basis with cattle and crops on the land in the interim years is the best way of rendering the pasture clean of most worm eggs. Resting fields for a matter of weeks or months will still mean the pasture is contaminated with worms. Dung collection or "vacuuming" as is performed by many horse owners is a good way to reduce the worm pressure on limited grazing space.

Coccidial disease in alpacas is usually caused by the alpaca-specific variety *Eimeria macusaniensis*. Severe disease can be caused even with low faecal oocyst counts, or even before oocysts are present in the faeces. The oocysts (eggs) of the coccidia organism are extremely hardy and can survive three years or more in buildings or on pasture. Therefore coccidiosis can still be a problem even with pasture rotation over a three year period, especially if the stocking density of the animals is high. Ploughing up pasture and re-seeding may be one way of reducing the coccidial

contamination. The newest and preferred treatment for *E. mac* is Baycox bovis. Vecoxan is also effective.

An oral drench of wormer that females are given just prior to giving birth is a sound approach as it minimises the worm burden for the females when they are at their most metabolically stressed and when their immunity is at its lowest. Moving the females to a clean nursery paddock after birth is good practice also.

Incoming animals should be quarantined for at least 7 days (21 if possible) on pasture that will not be used by the rest of the herd and where there can be no over the fence contact. Ideally check a faecal sample at entry and treat accordingly. Alternatively, treat on entry with Baycox bovis and four days of Panacur.

Worming products come from three families of chemicals, although the trade names for these drugs vary considerably. The three families are the **Avermectins** (e.g. Ivomec/Panomec), the **Levamisoles** and the **Benzimidazoles** (e.g. Panacur). The drugs which treat coccidial disease are from a different class altogether. Consult your vet to help you decide which is the most appropriate treatment in each instance. It is also important to give alpacas the correct dose of any anti-parasitic drug, as the dose rate in alpacas is often very different from what might be written on the bottle for sheep or cattle. The dose rates of the commonly used drugs are given below:

Panacur 10% oral suspension (Shake before use) – 2ml per 10kg orally (4 times the sheep dose) (In cases of confirmed/suspected *Nematodirus* or whipworm infection treat for 4 consecutive days).

Ivomec/Panomec injection – 1ml per 33kg sub-cutaneously.

Baycox bovis – 3ml per 10kg orally.

Note that weights should be rounded up to the nearest 10kg for all treatments in adults and up to the nearest 5kg for crias.

Nutrition

The successful feeding of alpacas is a complex topic and only a brief outline will be given here. All diets will need to contain the correct balance of the following elements: water, energy, protein, fibre, vitamins and minerals. Because of their South American origins, alpacas have a relatively efficient digestive system when compared with sheep and cattle. However, it must also be remembered that growth, pregnancy and lactation place additional demands on an animal's metabolism which must be catered for.

Feeds and feeding requirements are always assessed in terms of dry matter (DM) i.e. discounting the percentage/weight of the feed that is water. Adult alpacas will voluntarily ingest around 1.5% of their BW as dry matter daily when non-pregnant and non-lactating. This means that a 70kg alpaca will consume ~1kg DM daily, which for example, could take the form of ~5kg of lush pasture (which is ~20% DM) or 1.2kg of pasture hay (~90% DM). This daily dry matter intake (DMI) needs to contain all of an animal's daily nutritional requirements. Good quality forage alone may be enough to support alpacas without additional metabolic demands, and good Spring pasture may even provide enough energy and protein for growing, late pregnancy or lactating animals. However, these animals with higher nutritional demands will often require some of their diet to be made up of concentrates (e.g. sugar beet, calf pellets, oats or peas) to allow them to ingest sufficient amounts of energy, protein, vitamins and minerals. A maximum of 25% of DMI can be concentrates.

Regular condition scoring of animals is a cheap but vital tool, which is more reliable than bodyweight measurement alone. Each animal is palpated in the lumbar region and sometimes also over the ribs.

A score between 1 (emaciated) and 5 (obese) is assigned. The date and score of each animal should be recorded for future reference. Practice and consistency are the most important features of reliable condition scoring. Your vet can show you exactly where to palpate and help you decide what score to assign. Overweight animals need less feed, underweight animals need more or better quality feed. Remember to introduce new feeds slowly over 10-14 days to allow the microbes in the gastrointestinal tract to adjust.

Vitamins and Minerals:

Camelids have evolved to live in an environment which receives a large amount of sunlight and therefore ultraviolet (UV) light. The UV radiation absorbed by the alpaca's skin is used to produce vitamin D. This vitamin is involved in bone growth and skin health, as well regulating calcium and other mineral levels in the body. You may be aware of the disease in humans known as "Rickets", whereby bones are not calcified properly and become bendy and misshapen. A similar condition can occur in alpacas living in the environment that we have in the United Kingdom due to the relative lack of UV exposure. This has necessitated supplementation of alpacas in the UK with either oral or injectable forms of vitamin D. At Larkmead we commonly use the injectable form called Duphafrol ADE. The dose is 0.5-1ml/25kg. Growing animals are often given 3 doses (November, January, March). All animals should receive at least 1 injection in November, whilst pregnant females should receive at least 2 (November, January).

Many owners also supplement their animals all year round with Camelibra, a complementary feed produced by GWF Nutrition containing important vitamins and minerals. The recommended feeding rate is 1g/kg bodyweight.

Teeth

Incisor Teeth:

The 6 incisor teeth of the alpaca grow constantly, but are continually worn down through grazing. However, if they are not ideally opposed with the hard pad of the upper jaw, they have a tendency to become over-long and can eventually hinder the animal's ability to graze. For animals with this condition, we use a "Dremmel" type burring apparatus to file the incisors down to the appropriate length, sometimes under sedation if this is required. Such dental burring is a delicate procedure which should only be undertaken when truly required by a vet or a horse dentist who has experience of working with camelids.

Breeders are attempting to breed out this type of tooth problem and we would encourage you not to breed from animals with severe problems like this. An under-shot lower jaw of less than 5mm is acceptable, but if under-shot by more than this then the animal should not be bred from.

Fighting Teeth:

Males will develop a trio of fighting teeth positioned behind the incisor teeth and in front of the molar teeth, two on the upper and one on the lower jaw. In females these teeth are usually rudimentary. However, in males the teeth can become angled and extremely sharp and are capable of slicing through tendons, ligaments and blood vessels. Fighting males will often attempt to castrate one another! As such, trimming the fighting teeth to remove the sharp points is advisable on welfare grounds, usually when the male is around three years old. This can be carried out by your veterinary surgeon using obstetrical wire or a Dremmel burring apparatus. Sufficient restraint and often sedation is required.

Tooth Root Abscesses:

Tooth root abscesses are a common problem in alpacas. They require treatment of some kind in the majority of cases and do not normally self-resolve. We are unsure why alpacas seem more prone to this problem than sheep, but it is most probably to do with the different feeding they are exposed to in the UK compared with their South American origins.

The abscesses begin when food material wedges itself between the gum and the tooth, setting up small pockets of material on which bacteria can grow. These bacteria then slowly move their way down the side of the teeth to the tooth root where an abscess forms. The bony surroundings prevent the body fighting the infection and removing infected material in the normal way. Ongoing inflammation and infection causes the bone to re-model and swell. This swelling of the jawline is usually the first sign noticed by an owner and may be accompanied by weight loss due to reduced feed intake because of dental pain. Eventually, in a large number of cases, the abscess will burst through the skin and creamy pus is seen exuding from the swollen area.

Approximately 50% of cases will respond to flushing and a long course of antibiotics at high doses. The other half will require surgery to curette (scoop out) the rotten bony material and allow the area to drain. It may also be necessary to remove loose or rotten teeth. In some severe cases multiple teeth roots are affected and the prognosis can be poor. The majority of cases will resolve with time and treatment, allowing the animal to return to normality.

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