Alpaca Welfare and Wellbeing

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Nutrition

Alpacas evolved to eat and digest the native grasses found at high altitude in the Andes which for most of the year are of low nutritional value. A number of unique adaptations have allowed the alpaca to thrive under these conditions. Notable is having a three-chambered rumen containing specific bacteria which are able to break down the fibrous grasses into sugars. Additionally, waste nitrogen (as urea) is extracted from the bloodstream back into the stomach to enable increased growth rates of these bacteria. The plant material and bacteria are subsequently digested thus enabling the alpaca to extract the maximum possible protein from the material eaten. These adaptations are critical in their native environment but on New Zealand paddocks with lush rye grass, there is a risk of animals putting on too much weight - refer to the condition scoring section below. Alpacas require 1.8 - 2.0% (dry weight) of their body mass per day of feed making them more efficient consumers than sheep. Everyday access to good grazing is a given. Supplementary feeding is not usually required except during the facial eczema season or for putting weight back onto a thinner animal. Alpacas are very keen on kibble (pellets) but care should be taken as:

- They have a high calorific value and feeding to animals not needing them can lead to excess weight gain.
- Kibble should only be fed mixed in with Lucerne mix and meadow chaffs due to the risk of 'choke' - large numbers of pellets eaten quickly which swell and form a blockage in the oesophagus. Other than as above, they may be fed alone in very small quantities or used as rewards during training.

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Routine care.

Good husbandry practices are essential to support the good health of alpacas and most of these can be performed by the owner.
Please note that the information given here is for guidance only. An alpaca owner must know the normal behaviour of each of their animals and should one behave abnormally, veterinary consultation is strongly recommended.

For cria:

- Immunisation. A vaccination programme should be started before the immunity provided by the dam's colostrum antibodies fades. A series of injections are needed to protect the cria from life-threatening bacterial infections caused by Clostridia; these are Pulpy Kidney, Malignant Oedema, Tetanus, Black Disease and Blackleg. Vaccines against these diseases such as Multine 5-in-1 or Ultravac 5-in-1 are widely available from veterinary practices and farm supply centres. The selenised versions of these vaccines should not be used unless the owner is certain that no other sources of selenium are being given. Most mammals require extremely small quantities of selenium in their diets and it is easy to overdose with this potentially toxic element. An injection schedule and dosage volumes should be discussed with your vet or alpaca breeder. Note that all vaccines must be kept refrigerated until just before use.
- Vitamin D promotes calcium absorption and maintains adequate calcium and phosphate serum concentrations which enables normal mineralisation of bone. Growing animals therefore have greater vitamin D requirements than adults. Alpacas have higher vitamin D requirements compared to other ruminants likely due to adaptation to the very high UV exposure in their high altitude native environment - just as in humans, UV exposure to the skin is required for activation of vitamin D. As most alpaca are now farmed at low altitude and the dam's milk has only low concentrations of vitamin D, supplementation is required. The cria should be injected with vitamin D by subcutaneous injection at defined intervals. The oil-based vitamin A, D and E supplement Hideject is suitable. It is particularly important that the timing and dosage to be given are discussed with your vet or alpaca breeder as an excess of vitamins A and D can be toxic.
- Worming. At Te Korito Alpacas, it is done at 3 months and at weaning.

For adults:

Most of the annual husbandry activities can be done at shearing time as each alpaca will be restrained on the table.

- Annual injections. The following are usually given:
  - A 5-in-1 vaccine against clostridial diseases
  - Vitamin D supplementation, particularly if the animal is under three years old or darkly fleeced.
  - Worming. The frequency of worming has been the subject of much discussion. Alpacas normally have a low worm burden because a communal dung site (midden) is used, and they are instinctively reluctant to feed around it. Worms and worm larvae are therefore less likely to be eaten. However, stocking rates on alpaca farms are invariably far higher than in their native environment so middens can become widely distributed, particularly with the females. Consistent and effective removal of the middens is essential. Cross grazing of the paddocks with other livestock, especially horses, is effective in controlling worm numbers as horses will graze over the middens and are not susceptible to the worms carried by alpaca and *vice versa* making this cross-grazing method valuable. Unfortunately, some alpaca dung will inevitably be missed and the worm eggs are remarkably resistant to being dried out. There are currently no realistic means of killing worm eggs in the paddocks. Moreover, there is increasing resistance to drugs used for drenching so some owners now prefer to drench only if worms are shown to be present in dung samples. This requires collecting fresh faecal samples from each animal and submitting these for egg counting. Discussion with your vet on the timing, choice of worming drug and dosage rates will help here.
    It is good practice to drench all new alpacas and those spending time at your farm, for example, for mating. Ideally they should be kept apart in a quarantine paddock for a week before introducing them to the main herd.

- Toe nails.
  Some alpacas, notably with black nails, will seldom need them trimming. Most will though and it prevents the nails from twisting and deforming the toes. When they become too long they should be trimmed back using straight-bladed clippers. On the shearing table, the nail is simply trimmed level with the pad base. With the alpaca standing, one person holds the alpaca's head whilst another, facing backwards, will lift the foot and trim the nail. Inspection of the nails by lifting the feet should be carried out several times a year as occasionally a nail may curve over and press into the pad. For a video demonstration, this YouTube video will really help you.
- Teeth trimming
  Alpacas have 30 to 32 adult teeth which will have all erupted by about six years of age. At the front of the mouth are six lower incisors which make contact with an upper dental pad, an arrangement that enables the alpaca to grip and tear off plant matter. At the back of the mouth on each side, top and bottom jaws, are two premolar and three molar teeth for grinding the food down. Between these sets are the fighting teeth comprised of a third incisor each side at the top plus upper and lower canine teeth. In males, when fully erupted at around five years, these teeth curve backward, are razor sharp and designed to lacerate an opponent during a fight. They can measure 2.5 cm in length and inflict serious injuries to the head, legs and testicles of an opponent. Trimming of the fighting teeth may be needed and is most commonly performed on the more aggressive males. Females also have fighting teeth but they often barely protrude from the gum line and their presence is seldom an issue anyway due to their more sedate behaviour.
  All alpaca teeth grow continuously and are ground down by grazing and food grinding action. The teeth are deciduous, that is the first set is replaced by permanent teeth. This starts with the molars at six months and the incisors at around two years old. The incisors need to correctly align with the dental palate to ensure efficient grazing. Should there be poor alignment, the teeth will miss the palate and over-grow due to lack of wear. In this case, they should be trimmed to prevent difficulty in feeding and snapping of the teeth. There are several methods for this. Apart from a specialised electric cutting wheel (based on an angle grinder), all need veterinary involvement as sedation of the alpaca will be needed. Teeth should be checked twice a year as growth rates do vary amongst alpacas.
- Weight, condition and condition scoring
  The weight of an alpaca is important and there are good reasons why an owner should know the weights of their animals:
  - As a measure of growth. Crias should have a rapid growth rate over the first year and a more gradual increase should continue until they are around three years old. If they deviate from this there may be underlying problems.
  - As a monitor of health - having a weight record over time will alert an owner whether there is a potential illness issue. Alpacas can easily lose weight under their fleece and it not be noticed.
  - For whenever drugs are to be given. Owners and vets frequently make a 'best guess' of an animal's weight in order to give the right dose of a drug. With some drugs, accuracy is less critical but with others, an accurate dose is needed to get a successful treatment but not cause any adverse effects due to overdosing.

  Most alpaca owners will not own a livestock scale to weigh animals so body scoring should be done on a regular basis. Data should be collated and records kept managing herd health and identify a possible health issue. Methods for doing this can be found in this Welfare code from the New Zealand government and this fact sheet. On a five point scale, the ideal body condition is scored at 3.0. Condition scores of under 2.0 or above 4.0 represent extremely thin or fat animals respectively. Most alpacas (except in late pregnancy or lactation) should maintain a body condition score between 2.5 and 3.25.
- Shearing
  In New Zealand, alpacas are usually shorn in late spring or early summer (ideally November) to avoid them being heat stressed during the warmer months. The most up-to-date AANZ list of shearers can be downloaded here. It is advised that owners contact their nearest or preferred shearer at least two months in advance to ensure they are included on the shearer's circuit.
  As alpacas lack flexibility in their spines, they cannot be shorn in the same way as sheep. Three methods of shearing are used:
  - With the animal standing - although perhaps less stressful for the alpaca, progress will be slow and there is a significant risk of cutting the animal with the shears. Unless the alpaca is extremely calm, this method is not recommended.
  - Laying them on the ground with the legs restrained by straps/ropes forwards and backwards to help keep the animal still. An assistant will hold the head and manoeuver the animal.
  - Laying the alpaca on a specialised shearing table. Essentially, the alpaca is walked to the table when in its vertical position, a sling placed around the alpaca's belly and the table rolled over to its horizontal position. As above, the legs are restrained by straps/ropes to forwards and backwards securing points and a further rope may be loosely fastened around the neck to prevent the alpaca from flailing its head and injuring itself.
    During shearing, an assistant will manouever the alpaca in a way that allows effective shearing with the minimum of stress to it. Electric clippers are mostly used although with different combs to those used for sheep. A skilled shearer will take under 15 minutes per animal and be able to remove the fleece blanket in one piece which is rolled up and placed into a labelled paper sack. Second-grade fibre from the neck, legs and underside is separated off into a different bag. The shearer should also make the minimum of second cuts as these short lengths can become mixed with good length fibre. It is advised that the tail fleece is trimmed but kept long and wide enough to cover the genital area thus protecting it from sunburn.
    Frequently, owners and helpers will be performing injections, clipping toenails, collecting fleece, taking fibre samples, etc, during and after the shearing which minimises the time the alpaca stays restrained on the table.
    Shearing is a stressful experience for alpacas and they can behave in a variety of ways. Although some may appear relaxed, others show their fright by urinating during shearing or venting their anger by targetted spitting at the shearer and assistants (a cloth lightly covering the nose and mouth will prevent this). Keeping other herd members close by and if possible visible to the animal being sheared will help and if a dam has a cria, keeping it close and visible will help.
    In essence, being well organised for shearing will minimise the time spent restrained and thus the stress to your alpacas.

  As mentioned above, when the blanket is being removed, owners can take a fibre sample from the mid-side of each animal for analysis. The samples may be sent to a testing laboratory such as the New Zealand Wool Testing Authority or SGS New Zealand. There are a number of analytical methods available for these tests but all provide measures of:

  - Mean fibre diameter, given in microns (micrometres, 1mm = 1000µm). Sometimes a graph of the fibre distribution is also provided,
  - Standard deviation (SD) of the mean: essentially, 68% of the fibre diameters will be within the mean ± 1 SD, 95% of the diameters will be within the mean ± 2 SD,
  - Coefficient of variation of fibre diameters (CV or CVD): is a measure of the variation in fibre diameters relative to the mean fibre diameter. A higher CV shows greater variation in the fleece sample. It is calculated from the following:
    %CV = (standard deviation ÷ average fibre diameter) x 100
  - Percentage of fibres >30µm,

- Comfort factor: calculated as 100 - percentage of fibres >30µm.
  Testing of other fibre parameters may also be available, for example, staple length, curvature and curvature SD.

Different measurement methods will likely give slightly different results so using just one analytical laboratory will make year-to-year comparisons valid. The data obtained will help in making breeding decisions.

The fleece blanket requires skirting, a process to remove guard hair, vegetable matter and second cut fibres. This can either be done at the time of shearing, if enough knowledgeable assistants are available, otherwise the fleece should be carefully rolled up as it is removed from the alpaca and stored in a large paper sack until time permits. A skirting frame can be made by attaching large holed plastic trellis to a wooden frame, to give an area of around 2 x 1 metres in size. The blanket should be unrolled and spread out on the mesh, with the cut side downwards. Shorts and dirt will immediately drop through the mesh and the frame can be rattled to help. Remove any coarse hair from the fleece edges plus sticks or other vegetable matter from the body of the fleece. It is then ready for further processing.
Alpaca owners know that fleeces do contain a significant quantity of dust, sand or general dirt. This needs to be removed before any sorting and carding takes place and an efficient means to do this is use of a tumbler. Many designs exist but all involve a mesh-sided cage which can be rolled or rotated allowing the dirt to fall out. Some are rotated using an electric motor or even attached to a concrete mixer engine (both with speed reduction mechanisms) but in our experience, a cage of fleece can be easily hand-rotated when mounted on a smooth shaft. A leaf blower used during rotation is spectacularly effective at removing the dirt and shorts. Standing downwind of the drum during this process is not advised! Once complete, the fleece is ready for picking out of any remaining vegetable matter and it can then be carded and spun into wool if desired.
A list of alpaca fibre carders and spinning mills in New Zealand can be found on the Alpaca Resources page.

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Fitting of Halters.

The correct fit is extremely important when putting a halter onto your alpaca. Alpacas are obligate nasal breathers, that is, they only breathe through their nostrils except under particular circumstances - usually after disputes which also involved spitting. In spite of alpacas having a long nose, only the top section is bony and able to accept any downwards pressure - it is critical that the nose band sits on this bony part. Note that there is variation in the length of the bony section so the band must be at the very top of the nose.
There is a very good article on halters by Marty Bennett at CAMELIDynamics which explains the available types of halters and how to correctly fit one onto your alpaca. The article has clear picture examples of good and bad fitting. It can be downloaded directly on this link from CAMELIDynamics.

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Alpaca Welfare Legal Protections.

Changes to the New Zealand Animal Welfare Act in May 2015 gave the Ministry of Primary Industries (MPI) the ability to make a Code of Welfare for Llamas and Alpacas under the Act. This was released in 2018 and contains minimum standards and recommended best practices to improve their welfare.
The 2018 MPI Code of Welfare can be downloaded in this pdf file. Ammendments to the Animal Welfare Act (effective 9th May 2021) cover "Use of equipment that may injure llama or alpaca" and "Cutting teeth of animals" as sections 23 and 56D respectively. These ammendments can be viewed in the Animal Welfare Act link above.
In Australia, a similar welfare document has been published by the Australian Veterinary Association.
In the United Kingdom, the "Alpaca, Llamas & Guanaco Welfare Guide" was released in 2014 by the British Alpaca Society.
In the United States, a document entitled "Recommended Practices in Caring For Llamas & Alpacas" was issued in 2005 by the Camelid Community Standards of Care Working Group.

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References.

The literature below can be accessed by clicking on the highlighted link. Some links will access the appropriate web page from which the article can be downloaded but others will immediately start downloading the full reference.

65. Grund, S., Vogel, M. and Mülling, C.K.W. (2018). Morphometric evaluation of the growth of Alpacas (*Vicugna pacos*) from birth to 36 months of age. Small Ruminant Res., 166: 61-65.

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