

Alpaca Advice

Alpaca digestion and nutrition

South American camelids are separated from true ruminants such as sheep and cattle partly because they differ in the structure of their stomachs.

The basic requirements for alpacas are water, energy, protein, fibre, vitamins and minerals. It is essential that requirements of the first four essentials (water, energy, protein and fibre) are satisfied before assessing vitamin and mineral status.

- In cool weather alpacas may drink 3% of their body weight (for dry adults) to 8% of their body weight (for lactating or growing animals). In hot weather these figures may increase 10 – 15% of body weight per day.
- Energy from digestion of pasture or supplementary feeds is necessary. If there is not enough energy in the feed, the animal will lose condition.
- Protein is the building block for muscle and important for growing and lactating animals
- Fibre is essential for the forestomach to function effectively. Alpacas with access to plentiful pasture will ingest sufficient fibre. However, if grass becomes excessively short (for example during drought) or is extremely lush, hay must be provided as a source of fibre.

Paddock Feed

- Alpacas are primarily grazers and eat small amounts of a wide variety of plants. The quantity eaten will vary considerably and is dependent on the digestibility of the pasture (actively growing, green grass/legumes before flowering are the most digestible) and also on the animal's physiological status – lactating females will have a much higher nutritional requirement. Alpacas will do well on high quality native pastures or most introduced species.
- Alpacas are very effective at extracting nutrients (protein and energy) from the available feed. Protein and energy requirements vary depending on the animal's status – an adult wether requires less energy and protein than a pregnant or lactating female alpaca. Ideally the alpaca's diet should also include around 20% fibre.
- Although non-lactating adult alpacas can survive harsh feed conditions they do best on good quality pasture. The growth of a variety of grasses and clover in good quality soils will provide your alpacas with balanced nutrition.

Supplementary Feed

- Alpacas should ideally be pasture fed at all times. They rely on foregut fermentation and chew the cud, like sheep and cattle, to extract nutrients from feed.
- Depending on location, paddock feed may not be adequate throughout the year, particularly for those with higher protein or energy requirements. Pregnant and lactating females, plus growing cria and weaners, need a higher quality daily intake than dry adult alpacas.
- When the quality or quantity of pasture is limited, alpacas may be supplemented with good quality lucerne or clover hay and/or high energy or protein feeds such as cracked lupins according to their physiological state (e.g. pregnancy, lactation, growth, maintenance).
- Alpacas can also be supplemented using a commercial mix or pellets designed for alpacas.

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- Oaten, paddock or grassy hay will provide less in terms of protein and energy but are a good source of fibre. Roughage/fibre in the form of hay may be required especially if pasture is very short or has a high- water content.
- Supplements designed for other species, such as horses, should not be fed to alpacas.
- In Australia there is a ban on feeding Restricted Animal Material (RAM) to any camelid.

Vitamin and Mineral Supplements

Alpacas have a daily requirement for a wide range of minerals and vitamins, most of which will be met if the animal has access to good pasture and some supplementary feed or mineral mix.

Vitamins are usually adequate in a normal diet. Vitamins B and C are readily available from microbes living in the forestomach, so an animal with a well-functioning digestive system should not require supplements. Vitamin A and E should be readily available in pasture but at times it may be necessary to supplement these.

Vitamin D is essential for bone development and metabolism and is normally produced through a reaction between precursor on the diet (including phosphorus) and sunlight. Alpacas have higher vitamin D requirements than ruminants, possibly due to them being adapted to very high UV exposure in their native environment. Vitamin D is often administered with phosphorus. Vitamin D requirements are especially high for young growing animals, animals with darker skin or heavy coat (blocking UV light) and animals not sufficiently exposed to UV light (i.e. south of latitude 34°S during wintertime in Australia).

Vitamin D deficiency in growing animals leads to a bone condition called rickets. However massive doses of vitamin D can be toxic and result in calcium deposits within blood vessels and on adrenals, stomach wall and parathyroids, as well as reduced growth, hyperphosphataemia, weight loss, anorexia, debilitation.

Vitamin D is generally available in an injectable form containing vitamins A, D and E. The dose required per KG body weight will vary depending on concentration of vitamin D in the different ADE products.

Cria should receive injectable ADE at around 10 weeks of age. A further dose may be required in mid-winter in southern parts of Australia. Adults (particularly those with dark, dense fleece) should receive one dose in midwinter in southern areas. As vitamin D can be toxic if administered in excess, new owners are advised to consult their veterinarian to confirm the required dose of to be administered.

Minerals include calcium, potassium, sodium, chlorine and sulphur. Trace elements include cobalt, copper, iron, manganese, selenium and zinc. Minerals are usually supplied in a normal diet; however, it is wise to consult with a local agronomist to find out if any are deficient in your soil. In many parts of Australia, particularly where alpacas thrive, the soil is deficient in selenium, leading to a possible deficiency in the alpaca's diet.

In alpaca, it is more usual to see sub clinical problems such as a reduced fertility. Selenium deficiency is responsible for 'white muscle disease' in young animals (well documented in lambs) and for infertility in adults, especially females.

Selenium supplementation should be implemented carefully as too much selenium can lead to severe problems including sudden death in its acute form or abnormal nail and fleece growth in its chronic form.

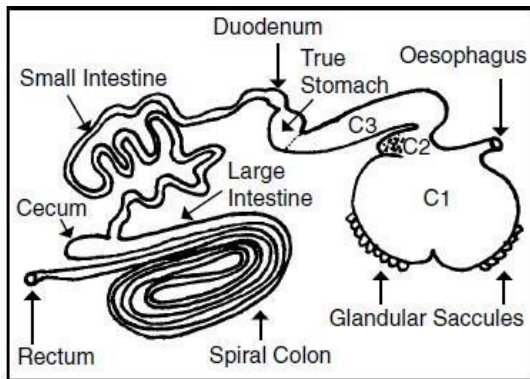
With the exception of slow release products, specially formulated to provide selenium supplementation for a long period after administration (e.g. DEPOSEL[®]), the dose to be given to an alpaca is 0.1mg selenium per kg bodyweight, either orally or by subcutaneous injection. With slow release products, the dose can be much higher. As the difference between the therapeutic / preventative dose and the toxic dose is narrow, check the selenium status of your animals before implementing a supplementation regimen. Normal values in alpaca blood are reported as being above 0.5 to 0.7µmol/L selenium.

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Digestive Physiology

The alpaca stomach has three compartments (C-1, C-2 and C-3)

The first compartment of the stomach (C-1) is a large fermentation vat. As with ruminants, alpacas have a vital symbiotic relationship with the microscopic organisms that live within the gastrointestinal tract. These organisms break down the cellulose in the feed that the alpacas eat. The alpaca provides the feed and stable environment (relatively neutral pH, anaerobic, moist medium) whilst the bugs break down the food that is eaten. Cria have a poorly developed C-1 when born. By 8 weeks of age, the C-1 reaches adult proportions. It takes about 12 weeks to reach full adult activity allowing the breakdown of plant fibre.



The microbes contain the enzymes to break down cellulose, urea and protein using the carbon and nitrogen for their own growth. By-products from microbial growth and multiplication are then used by the alpaca. These include volatile fatty acids which provide the alpaca with energy and B-complex vitamins. The microbes themselves are washed from C-1 down to C-3 and the intestine where they are digested to provide the alpaca with protein and other nutrients.

When you feed an alpaca, you are also feeding the microbial population in C-1 and C-2. The population dynamics of different species of bacteria in C-1 and C-2 depend on the prevailing source of ingested material. This is why it is very important to introduce any feed changes gradually. It is necessary to give the microbial population a chance to adjust to any change in conditions. Access to good quality hay for two or three weeks during change-over provides a healthy buffer.

Alpaca faeces are pelleted and begin to form at the start of the spiral colon. Alpacas usually use a communal dung pile for defecation and urination and generally avoid grazing near these areas.

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