

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.

Disclaimer: This advice is of a general nature. Seek veterinary or expert advice for your circumstances.

- 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.

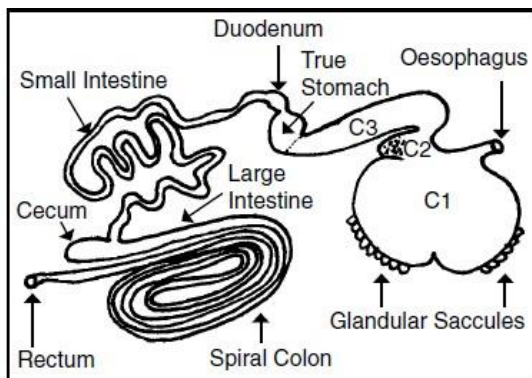
Minerals include calcium, potassium, sodium, chlorine and sulphur. Trace elements include cobalt, copper, iron, manganese, selenium and zinc. Minerals are usually supplied in a normal diet; however, it is wise to consult with a local agronomist to find out if any are deficient in your soil.

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.

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. Crias 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.

Disclaimer: The advice given here is of a general nature. More detailed information for your area may be provided by an agronomist, veterinarian or other expert with local knowledge.

Australian Alpaca Association Ltd. • +61 2 6151 2073 • info@alpaca.asn.au • www.alpaca.asn.au