

Keeping the Camelid Herd Healthy
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Basic camelid facts:

- Native to the Andes Mountains and adapted to severe cold, wind and sparse seasonal vegetation.
- In this habitat, they are used for fiber, meat and labor.
- With the exception of the dog, the llama and alpaca are one of the longest domesticated species.
- In the USA llamas and alpacas are used for packing, fiber production, guard animals and breeding stock for shows and competitions.
- They graze and browse.
- Camelids are pseudo-ruminants – missing the omasum.
- All four camelid species can cross breed (alpaca, llama, vicuna and guanaco)
- Llama males average 300 -400 pounds, females 230-350 pounds. Alpacas range from 100 – 175 pounds.
- There are two types of alpaca – Huacaya and Suri. Huacaya have short fiber that is crimped and springy. Suri fiber is long with pencil locks hanging on body.
- Females can breed at 15 – 18 months. Males are not at full sexual maturity until 3 years.
- Life span is 20+ years.
- Gestation is 11.5 months (350 days +/- 14 days).
- They are induced ovulators so don't exhibit estrus behaviors.
- Breeding occurs with the female in sternal recumbency (kushed) and takes about 20 minutes.
- 90 % of crias are born between 7am and 3pm
- Crias are covered with an epidermal membrane that dries after birth. Females don't lick their young.
- Camelids require 1.5 to 2% (as a minimum) body weight per day as dry matter feed for maintenance.

Routine Monitoring:

Owners should be encouraged to observe their camelid herd daily. At the least do an over-the-fence assessment that everyone is up and with the herd. Also, take note that they are eating and drinking. Camelids are very stoic and have individual personalities and behaviors. It is important for owners to watch and monitor what is normal for an individual and to understand herd hierarchy.

Nutrition

In their native environment camelids are adapted to sparse pastures with crude proteins (CP) of 6-7% dropping to 4-5% seasonally with total digestible nutrients (TDN) of 45- 50%. In comparison, North American pastures have CP's of 9-11% and TDN of 55-65%. With traditional grazing the animals would walk 3-5km/d, while in the USA we keep them in small pastures and dry lots. As a result, obesity is more common due to the lack of exercise and better digestibility and nutrient content of the forages.

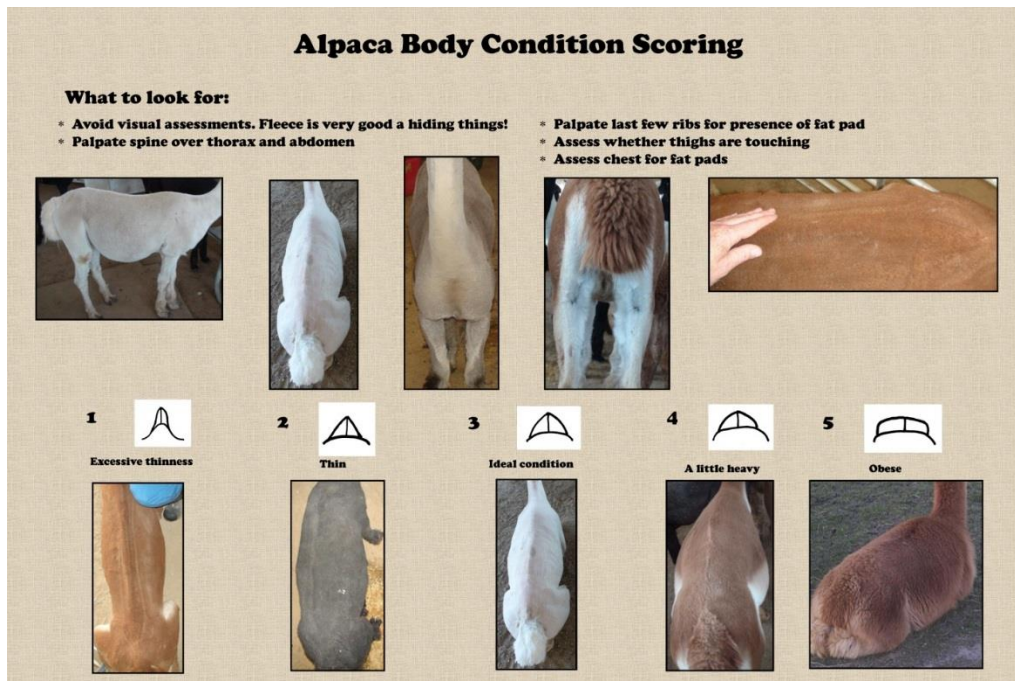
Confinement grazing increases social stress and decreases forage selectivity and variety.

Camelids are competitive feeders and eat based on social hierarchy. If insufficient space to feed, you will see 3 waves of feeding: 1) dominant compete for highest quality feed, 2) middle eat the remaining high quality feed, and 3) submissive may not eat at the trough or end up with residual stalks.

Water consumption requires access to adequate water supply. This is important if using water buckets. Seasonal variation in intake occurs with changes in temperature and humidity. Llamas will drink 4-6L/d and Alpacas 2.5 -4L/d. Therefore, a five-gallon bucket will be sufficient for 2-3 llama or 4-5 alpaca in the summer each day.

Body Condition Scoring

Animals should be body condition scored at least twice yearly (figure 1), but preferably on a monthly basis. This is a more objective method of monitoring health of animals than weighing animals. The body weight is much more variable due to variation in time relative to eating or defecation. Scoring technique is similar across species and requires hands-on assessment of body condition over the lumbar vertebrae between the last rib and the pelvis. A scale of 1 to 5 is commonly used, but some prefer a 1 to 10 scale. Consistency is the most important factor regardless of scale used.



Production Stage	Optimum BCS
Breeding	3-4
Early to mid-gestation	2.5-4
Cratation	3-3.5
Weaning	Greater than 2

Mucus membrane color

The color of the scleral (eye) conjunctiva should be checked weekly according to the FAMACHA chart to detect anemia associated with *Haemonchus* infestation. This will allow slightly objective monitoring of anemia and assist with deciding which animals need dewormer.



Fecal egg count (FEC)

We recommend using a combination protocol of regular fecal egg counts and FAMACHA scoring to estimate the current parasite load in a herd. A minimum of 10% of the herd or 10 animals (whichever is larger) should be sampled. Quantitative counts of each type of parasite egg present will allow you to determine if internal parasite burden requires treatment. If the use of a dewormer does not seem to be effectively treating parasitized animals we recommend a fecal egg count reduction test (FECRT). This test determines resistance to a specific type of deworming product by taking fecal samples pre and 10-14 days post deworming to look for a minimum of 90% egg count reduction. Less than that indicates resistance to the dewormer used. By combining several monitoring techniques and pasture maintenance, you can more effectively combat parasites.

Routine husbandry:

Foot Trimming:

Camelids don't have a hoof. They have a padded covering to the bottom of the foot and a toe nail at the end. The padded foot minimizes damage to the terrain and is ideal for tracking. There are 2 digits on each foot. The first phalanx is connected to the fetlock and the second and third are horizontal to the ground. The splayed toes increase stability and sure-footedness. The thick pad is comparable to the dog.

The small non-weight-bearing nail is at the extremity of the digit and is closely attached to the P3 via the corium.

The natural gait is to walk, pace, gallop.

The broad footpad allows greater lateral stability during pacing. The toes should point forward; if not, this indicates abnormal conformation or lameness. Overgrowth of the toenail is the most important disorder of the camelid foot. It is often associated with more continuous growth periods because we feed them consistently all year (no seasonal variation) and confinement to good terrain

versus walking on mountains results in insufficient wear/curling of the toenail. Chronic rotation of the toenail results in rotation of the interphalangeal joints leading to pain and arthritis.

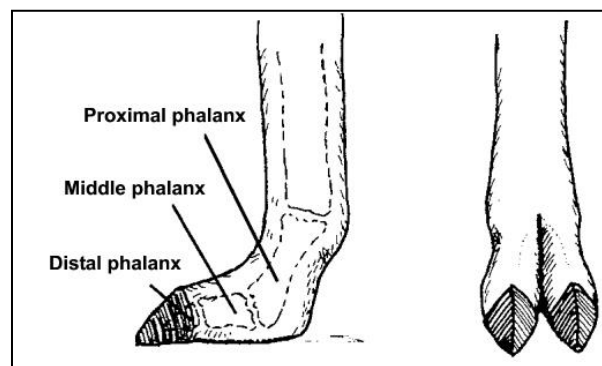
The goal is to keep the toes trimmed and in proper alignment.

Trimmer – use rose/shrub pruners, sheep hoof trimmers etc...

Trimming can be done with the animal standing similar to a horse or restrained at shearing time.

Be sure to keep the legs under the animal for balance. In some cases individuals respond better to having their rear legs pulled out behind them.

The feet consist of a pad and claw – much like a dog. The goal is to trim the toenail flat with the pad and remove any under run pieces along the edges. Finally trim the tip in a top-to-bottom direction to remove the sharp end. This last cut is to provide less damage should they happen to kick you afterwards. If you have toes that are curled, taking nicks out of the dorsal spine can help relieve the curve with time.



Dental Care:

- Age of Permanent Tooth Eruption in Camelids

First incisor (I1)	2.0 y
Second Incisor (I2)	3.0 y
Third Incisor (I3)	3.0 to 6.0 y
Canine	2.0 to 7.0 y
First premolar (PM3)	3.5 to 5.0 y
Second premolar (PM4)	3.5 to 5.0 y
First molar (M1)	6 to 9 m
Second molar (M2)	1.5 to 2.0 y
Third molar (M3)	2.75 to 3.75 y

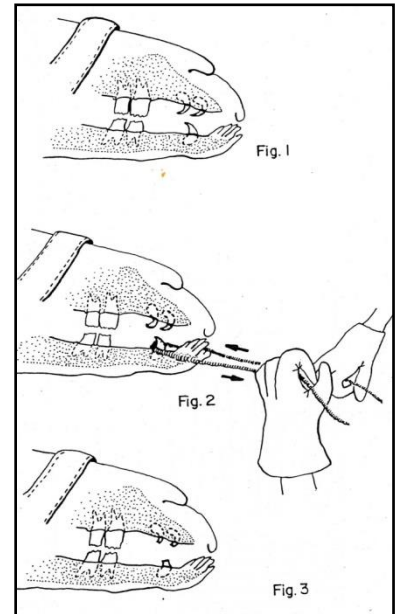
- Oral examination – *Avoid putting fingers in the mouth!!* Teeth can be palpated through the cheek to assess any pain or long points on the molars. Palpate the ventral mandible for symmetry and swelling (tooth root abscesses are not uncommon). Assess the incisors without opening the mouth but simply parting the lips. The incisors should meet the front edge of the dental pad. Intact males may have 3 pairs of fighting teeth (2 pairs top and 1 bottom).

- Tooth trimming - Both incisors and fighting teeth may be trimmed. Incisors grow continuously and should meet the edge of the dental pad. Commonly inferior prognathism or underbite can occur.

Incisors – a specially designed grinder adaptor can be used to quickly trim incisors. Alternatively, a dremel or gigli wire may be used; however, caution must be exercised with excess heat generated from the dremel.

Fighting teeth are trimmed in the male to make them less dangerous to other camelids and humans. The fighting teeth comprise of the upper 3rd incisor and the upper and lower canines. Fighting teeth are typically cut with gigli wire or dremel tool 2 – 3mm above the level of the gum. Caution needs to be exercised so teeth aren't fractured when side-cutters are used.

Restraint for either procedure may require chemical immobilization or physical. The latter can be achieved by placing a rubber donut (i.e. dog chew toy) between the arcades or use a thick lead rope folded in 4 and run between the teeth and held by an assistant with the ears behind the head for added control.



Castration:

Early castration before skeletal maturity (1-2 y) results in a ‘post-leg’ conformation due to delay in closure of the growth plates. To avoid these growth plate issues, it is recommended to castrate alpacas at greater than 12 months and llamas at greater than 18 months.

Shearing:

Shearing time provides an opportunity for temporary restraint with time for husbandry interventions like tooth and hoof trimming and vaccinations. Annual shearing in the spring is recommended to prevent heat stress. In addition, paddling pools, sprinklers and shade structures are necessary for heat abatement during the Midwest summers. Most heat abatement is from the axilla and inguinal areas. A therapeutic shearing involves removing the fiber around the abdomen.

Vaccination:

No vaccines are currently labeled for use in camelids. Thus, vaccination of camelid herds should be done as a means to support management decisions that reduce exposure and susceptibility to pathogens. Vaccine recommendations should be based on the risk assessment of the herd based on diagnostic information and theoretic risk for each herd in the geographic region.

Clostridium perfringens type C and D and *Clostridium tetani* toxoid are the current 'core' vaccine recommendation. Every animal should receive an annual booster vaccination. In areas where snakebites or liver fluke are a problem the 7-or 8- way clostridial vaccines may be warranted.

Other vaccines to consider depending on location and risk are Rabies, West Nile and Lepto.