Llama Medical Management

International Llama Association Educational Brochure #4

The purpose of this brochure is to aid new and old llama owners in recognizing signs of illness in their animals, so that assistance may be sought and appropriate measures initiated.

The science of veterinary medicine is adequate to serve the needs of wild and domestic animals. The art and practice of llama medicine is advancing steadily, with adequate literature and continuing education courses available to train veterinarians and owners alike. Following are a few fundamental characteristics of health care that all llama owners should know. First, it is important to know the normal llama.

The Normal Llama

Adult llamas vary in size from 240 to 550 pounds, while newborn babies normally weigh 18 to 40 pounds. Knowing the weight of your llamas is important in order to calculate food consumption, dosages for medication and anesthesia and, if you are packing, how much weight they should carry. Smaller animals can be held and weighed by difference on a bathroom scale or placed in a sling and hung from a spring scale. Larger animals may be taken to a commercial weigh station at a feed supplier. Commercial scales designed for llamas are on the market.

Normal adult rectal temperatures vary from 99.0-101.8 °F and babies up to 102.2 °F. Animals kept in warm climates may have body temperatures of 104°F during hot summer days. The heart rate of a resting llama ranges between 60-90/minute and respiratory rate 10-30/minute.

Llama feces are pelleted and the color varies with diet. Initially the newborn baby passes an orangish brown feces called meconium. The meconium may be retained, requiring an enema to stimulate passage. Urine may be colorless to deep yellow depending upon its concentration. However, there should be no white, chalky sediment in llama urine.

Llamas have several unique anatomical structures that have an important bearing on an evaluation of their state of health. The llama and other camelids separated from the true ruminants (cattle, sheep, antelope, deer) early in their evolutionary history. Llamas are not true ruminants in a taxonomic sense. They do, however, regurgitate food from the stomach, chew it again and reswallow it. This act is called rumination, and the stomach functions much like the rumen of a sheep or cow. However, there are only three compartments to the llama stomach whereas the ruminant has four compartments. Llama stomach movement, which can be heard with a stethoscope over the left rear flank, is an important consideration in a physical examination. Llamas have 3-4 contractions per minute.

The location of the jugular vein on the neck differs from other domestic animals. The jugular vein is separated from the carotid artery for only a short distance near the angle of the jaw. The collection of blood samples or the administration of intravenous medication anywhere along the neck must be done carefully to avoid penetration of the carotid artery. The thickness of the neck skin of an adult male makes it especially difficult to visualize and locate the jugular vein.

A casual look at the mouth of an adult male llama will reveal the presence of sharp canine teeth. Male llamas use their teeth in fighting with other males, especially when receptive females are present. Rendering the canine teeth less dangerous to other llamas or people is a common and simple surgical procedure. Consult your veterinarian for details. Female llamas have smaller canines which are usually not a problem.

TTEAM training has become a popular method of working with llamas. Other training systems are also used. Trained animals may not require the restraint method described as follows. Always use the least amount of restraint possible.

Restraint

Most llamas can be restricted or trained to submit to simple examination and medication. The various levels of restraint are 1) halter and lead rope, 2) earing, 3) securing in a chute, and 4) chemical immobilization. The owner may be prepared to administer the first three, but it is unwise for an untrained person to use sedatives or anesthetic agents.

Stocks and chutes designed for llamas are available, or are easily constructed (see ILA Educational Brochure No. 5). Another common method of restraint is to press the llama against a solid wall while "earing" it as follows. Standing at the llama's shoulder, hold the halter and squeeze the base of an ear without twisting it. Hold on tightly. The llama will probably try to pull away. If additional restraint is necessary, the handler may release the halter and grasp both ears. Applied in this manner there will be no injury to the ear. The discomfort experienced by the llama diverts its attention from other manipulations such as taking the rectal temperature, conducting a rectal examination, or collecting blood from a vein. The llama will not become head shy as a result of "proper" earing. Holding the tail simultaneously may also help.

Llamas seldom kick, but some do. Most of the time they kick the hind leg forward and outward like a cow, but some are capable of kicking directly backwards. The safest place to stand is at the shoulder.

To take a rectal temperature without the aid of a chute, have someone control the head and press the llama against a solid wall. Stand at the side and lift the tail. Insert the moistened thermometer with a slight twisting motion for a distance of two inches and leave it in place for three minutes.

Recognizing a Sick Llama

Observation is the key to early detection of illness. Llamas are stoic in many ways and by the time they begin to exhibit outward signs of disease they may already be quite ill.

If the rectal temperature is over 103°F except on a warm day or after vigorous exercise, recheck it. A llama that doesn't eat for more than a day requires attention. Llamas on green pasture may require less water, but something is wrong if they refuse food. Other signs that should prompt further investigation include significant weight loss, diarrhea, difficult breathing, getting up and down frequently, or otherwise acting uncomfortable. To check for loss of weight, feel the backbone and top of withers periodically. A significant loss of wool, with or without thickening of the skin or scabs, also warrants closer examination. With neonates, floppy ears may signify anything from frostbite to prematurity, dehydration, pneumonia, septicemia, or insufficient milk supply.

Lameness or refusal to get up is another indication of illness. It is normal for a female about to deliver a baby to get up and down repeatedly. Abnormal head tilt, head shaking, tearing, slobbering, and a host of other signs alert the wise owner.

None of the above signs necessarily portend disaster, however, if observed, communicate immediately with a veterinarian as to what steps to take.

Preventive Medicine

Preventive medicine encompasses all aspects of management that enhances the health and well-being of a llama. Preventive medicine should be carried out with a team approach including the owner/manager, veterinarian and special consultants if desired (geneticists, nutritionists). Preventive medicine should begin with a pre-purchase examination followed by adequate housing, proper nutrition, sanitation, parasite control and immunizations.

Like other animals, llamas are susceptible to infectious diseases. Vaccines are available to protect other domestic animals against some of these. No vaccines have been tested and approved by appropriate government agencies for use in llamas per se. None-the-less, many vaccines are used in llamas with the hope that they will be effective. Owners should be prepared to accept this "off label" drug use.

Vaccination programs should be developed in consultation with a local veterinarian who is cognizant of disease problems unique to the area. A basic vaccination program should include at least tetanus toxoid and Clostridium perfringens type C and D. Other vaccines may be used if appropriate (Clostridium 7-way, leptospira bacterins and killed rabies vaccines).

The most desirable vaccine schedule includes vaccination of dams about 1-2 months before they give birth. Tetanus and clostridium require two injections one month apart during the first year and one booster shot annually. There is controversy as to when to start the cria on a vaccination program. Although technically contradictory, experience indicates that a vaccination program may be begun within 2-3 weeks of birth. Newly acquired llamas may be started on a vaccine series at anytime. Crias from unvaccinated dams, or crias that are orphaned before they get colostrum, require special care and a veterinarian should be consulted.

Parasite Control

Llamas may acquire both internal and external parasites. They share some species of nematodes (worms) with cattle and sheep. Management and control practices are similar to those for cattle and sheep. Some of the more important internal parasites in North America include stomach worms (Haemonchus, Ostertagia and Trichostronglus), thread, necked strongyles (Nematodirus), nodular worms (Oesophagostomum), whipworm (Thichuris), liver flukes (Fasciola), and meningeal worms (Parelaphostrongylus).

Ticks are fairly uncommon on llamas, but should be checked for if they are a problem in your area. Lice may be either of sucking or chewing variety and are unique to llamas. Unthriftiness, wool loss, and scratching are the usual signs. The tiny (1-2 mm) lice are commonly found on the skin along the backbone and around the base of the tail.

The treatment of parasitic infestations varies with the parasite, geographical location, and management practices used. Most llamas should be dewormed once or twice a year. Periodic fecal examinations for parasite ova should be conducted to monitor the effectiveness of the treatment.

Noninfectious Diseases

Compared to other livestock, llamas are relatively free of digestive disorders. Bloat is rare. Ulcers and stomach shut-down do occur and should be dealt with immediately. There is no single set of clinical signs that announce that a llama has a digestive disorder, but individuals not eating, not chewing their cud, lying down a lot, refusing to get up, grinding their teeth a lot, groaning, kicking at their stomachs occasionally should be examined immediately by a veterinarian.

The llama walks on a fatty cushion covered with a protective sole layer, except at the tip where the toenail is located. Nail punctures and stone bruises may occur, but the most common foot problem is overgrowth of the nail due to lack of activity. Thus, periodic trimming is necessary. Restraint is the most critical factor in getting the work done. Ideally, each llama should be trained to allow the feet to be lifted and trimmed as would be done with a horse. In lieu of that, and in absence of a chute, pressing the animal against a solid wall while grasping an ear and holding the tail will control most llamas. A pair of hand garden pruning shears or those used to trim sheep or cattle are the tools to use.

Medication Procedures

Oral worm medicines are frequently put into a paste or suspension with a nozzled dispenser. Insert the nozzle into the side of the mouth and express the drug slowly. The use of drench syringes, designed for cattle and sheep, is not recommended. Stomach tubes passed through the mouth may be used with instruction and supervised experience.

Some medication may be added and mixed with a little sweetened grain mix. If the medication is unpalatable, a small quantity of it can be smeared around the nostrils prior to offering the adulterated feed. Obviously, the llama must become accustomed to eating the sweet feed mix.

If a baby llama fails to pass the meconium, it may be given an enema using an infant bulb syringe filled with lukewarm water 2 or 3 times. If after five or ten minutes nothing is passed, a second enema may be used. If the bulb is pressed slowly and any build up of pressure in the rectum allowed to flow out around the nozzle, no harm will be done to the sensitive rectal tissue.

Adults require a greater volume of fluid. A hot water bottle with an enema tube attachment is suitable. A two quart porcelain or stainless steel enema can may be purchased in a pharmacy. The rubber tubing should be approximately one half inch in diameter. Lubricate the end of the tube and an index finger. The tube should not be inserted more that two inches. Allow the fluid (warm water is all that is necessary) to flow in by gravity. If a wave of contraction of the rectum starts to evacuate the water, don't force the water to remain by pinching the anus.

Intravenous (IV) Precautions about collecting blood from the jugular vein have already been discussed. It is even more important to avoid administering any medication into the cartoid artery. The tail vein is used by some veterinarians for collecting blood, but should not be used to administer drugs.

Subcutaneous (SC) Medication is deposited just beneath the skin. Although any location on the body is suitable, the most accessible areas are on the relatively woolless areas immediately in front of the hind leg and behind the front leg. Others prefer the area in front of the shoulder. Some vaccines and antibiotics are administered SC.

Intramuscular (IM) Any muscle mass is suitable. The largest and most accessible muscles are on the upper hind limb. Reach around behind the llama and insert the needle into the opposite leg in the wool-less area. Pull back on the plunger slightly to make certain a blood vessel has not been penetrated. The muscle mass above the elbow is also suitable.

In summary, llamas are generally hardy, healthy animals. Provide adequate preventive medical practices and observe your llamas frequently to detect early signs of illness. Work with your local veterinary practitioner to develop the best health care program for your animals.

References

I. *Caring for Llamas: A Health and Management Guide*, by Clare Hoffman, DVM and Ingrid Asmus. This book is available from the Rocky Mountain Llama and Alpaca Assn., 17190 W. 57th Pl., Golden, CO 80403-1113. Price $27.95, postpaid.

2. Llama Medicine, the March 1989 issue of a serial publication entitled *Veterinary Clinics of North America: Food Animal Practice*. Chapters are written by various authors and it was edited by LaRue Johnson, DVM. It is no longer in print.

3. Update on Llama Medicine, the July 1994 Issue of a serial publication entitled *Veterinary Clinics of North America: Food Animal Practice*. Chapters are written by various authors and it was edited by LaRue Johnson, DVM. It is available from W. B. Saunders, Washington Square, Philadelphia, PA, 19106-3399 (800-654-2452). Price, approximately $35.00.

4. *Medicine and Surgery of South American Camelids*, by Murray E. Fowler, DVM. This book is published by Iowa State University Press, 2121 S. State Ave., Ames, IA, 50010. 2nd ed., 1998. Price approximately $104.95 postpaid.

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