WINTERIZING YOUR CAMELID CARE PROGRAM

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As we enter the autumn months in North America, my thoughts drift to concerns for care and management of livestock during the often-harsh environmental conditions of winter. In general, llamas and alpacas are well suited to cooler temperatures. After all, winter in the Andes can be trying on the soul if one is not prepared for it. However, camelids are susceptible to extremes of environment, hot (hyperthermia) or cold (hypothermia). The highest risk animals on the farm are very young, very old, very thin, or diseased camelids.

Perhaps the biggest concern we have for hypothermia are newborn crias. Crias are born without the stores of fat needed from which to draw energy to maintain body temperature. Newborns are dependent on the dam's colostrum and milk to provide glucose, fat, and protein. Early and frequent access to these nutrients is critical for the cria to survive the first few days of life. Without the milk fat, crias have a limited ability to maintain body temperature and blood glucose, both of which are necessary to survival. When crias are exposed to extremes of temperature, they must burn energy at a much higher rate to maintain body temperature and the remainder of the body systems may become starved. At some point, the cria is unable to ingest adequate milk to survive and hypothermia begins. These crias are often found down in the pasture in a cushed position with the head and neck extended in front of them on the ground. This posture is designed to close off all areas where heat is lost: around the tail (perineum), between the legs (axilla and groin), the underside of the belly (ventral abdomen), and the base of the neck (sternum and thoracic inlet). At this point and if body heat and energy are not restored quickly, the cria will die from hypothermia and hypoglycemia (low blood glucose) within a few hours.

The veterinary community has spent considerable time and energy evaluating risk factors and developing prevention strategies for heat stress. This is time well spent but we must consider both sides of the coin. Several years ago, a new farm lost several alpacas to heat stress. The farm did not have adequate shade and had not sheared the alpacas. When the peak daytime temperatures rose above 90 F and humidity climbed to 80 %, the alpacas could no longer tolerate the extremes and several died before intervention could be instituted. The most significant factor seemed to be that the night time temperature did not fall below around 80 F. Thus, the alpacas could not exhaust the heat build up from the day before. This is bad when you are wearing an alpaca sweater! The next year, the farm manager was determined not to succumb to the same problem and the alpacas were shorn in April of the next year. Unfortunately, a bitter cold spell including freezing temperatures and snowfall hit that area late in April. Eight alpacas were hospitalized for hypothermia and, fortunately, all were saved. I enjoyed watching them walk around with Ohio State sweatshirts on!

These lessons are simple: management and husbandry practices greatly influence an animal's ability to thrive. Consider your farm in light of the following tips for prevention of hypothermia:

1. **Shelter**: Camelids must be provided with a shelter from which they can seek protection form environmental extremes. These facilities should have sufficient width, length, and height to allow protection from wind. If three-sided shelters are used, a portion of the open side may be enclosed to provide a more effective windbreak. The orientation of the shelter should be such that the open side is not presented to prevailing winds (e.g. in Ohio, shelters face southeast to brace against northwesterly winds). Our research has shown that llamas and alpacas will "loaf" (referring to relaxed cushing rather than seeking shelter for protection) in shelters that provide approximately 36 square feet per animal. During environmental extremes (e.g. cold below 20 F, high wind, hard rain, sleet/ice, heavy snow) llamas and alpacas will utilize shelters at a rate of 18 to 24 square feet per animal. Inadequate shelter space will cause animals to be "left out" without protection from the environment.

2. **Bedding:** Bedding should be sufficient to help camelids close off their natural thermal windows. Remember, in summer we are trying to increase the thermal window. In winter, our goal is to decrease this thermal window. I prefer straw for this purpose. Straw is inexpensive, clean enough to use for birthing areas, has adequate insulating features, and can be easily cleaned from the floor and fiber coat.

3. **Water**: Water is a critical nutrient in all seasons. Ingestion of water fluctuates with the temperature of the water. When water is near freezing or frozen, water intake is decreased. Insufficient water intake causes decreased feed intake and the ability to regulate body temperature becomes impaired. In lactating females, milk production suffers and crias will fail to gain weight or will loose weight. If passive waterers are used (e.g. buckets, troughs), the water should be refreshed daily or several times a day as needed. I prefer heated automatic waters to optimize access and decrease labor.

4. **Feed**: During extremes of cold, camelids have a vital need for energy. I am often asked to consult on farms during winter months because females are loosing weight, crias are not gaining weight, or hypothermia cases have been seen. Many of these problems can be tied to inadequate winter nutrition. Grain feeding may be increased to provide rapidly metabolizable energy sources, but this must be done cautiously. Over feeding of any grain source can cause acidosis in the fermentation chamber (C1) of the stomachs and this will exacerbate the problem. Corn is the "hottest" grain in that it provides the most readily fermentable carbohydrates of the cereal grains, but this also makes corn the most risky for causing acidosis. I prefer to add oats to a winter ration because this feed provides more fiber than corn and is less prone to acidosis. Example: if a herd is feeding a commercial camelid pellet ration at 0.5 lbs per head per day, oats may be added at 0.5 lbs per head per day to increase energy intake. The addition of the oats should occur slowly over two weeks to allow the flora of C1 to adapt to the change in diet. Hay should be analyzed before winter months. I prefer to test each new shipment of hay and make acceptance of the hay contingent upon this analysis. Total digestible nutrient content of the hay should exceed 55% and is most desirable to exceed 60% for winter forage. I recommend that every animal in every herd have a BCS (body condition score) done every month. Loss of body condition score should be addressed quickly unless it can be explained (e.g. females are expected to lose 1 to 1.5 BCS during the first 2 months of lactation).

5. **Feeding**: Providing adequate quality of feed is only one-half of the story. Providing adequate access to feed is the other. In regions where heavy snowfall occurs and in areas where ice storms are common, camelids must be able to gain access to feed. In these situations, I prefer to offer feed inside of the shelter so that animals are not required to walk to a different location to get feed. Camelids will opt for protection against environmental extremes rather that eat or may eat for fewer hours each day. For farms that have barns this is rarely an issue. Farms using three-sided shelters may have a more difficult time providing sheltered feed.

6. **Ventilation**: During summer months, high ventilation is desired. During winter months, ventilation remains important. When shelters are "battened down" for the winter, we must be careful not to over-insulate the interior. Camelids tend to urinate and defecate inside of shelters. Who can blame them – nobody likes a draft in the bathroom! If ventilation is too restricted in winter housing, ammonia and other gases from the dung pile buildup and can contribute to winter pneumonia and poor thriving crias. As always, hygiene is the key to success.

7. **Shearing**: Talking about shearing for winter seems strange at first, but what I am referring to here is 'when did you shear and how is your fiber growing'. Last year, I worked with a herd that had not been able to shear until late in July. Although nutrition was adequate, there was not much room to spare. The fiber coats had not grown well enough before winter to provide adequate protection from the wind.

Examination of the herd revealed a suboptimal herd BCS (average 4 out of 10) and approximately 25% of the herd had subnormal rectal temperatures (average of hypothermic alpacas 98 F). Although this temperature was not acutely critical, the chronic environmental stress decreased immunity, decreased lactation, and caused weight loss. Nutrition and sheltering had to be addressed quickly and within a few weeks the problem had stabilized. Unfortunately, the affected alpacas required over 1 year to fully recover.

8. **Maternity**: Two important concerns for newborns are cleanliness and warmth. Females have been known to give birth in open fields in the snow when they do not have access to a clean shelter in which to birth. These crias are at high risk for hypothermia if shelter is not provided. In our research, females that had access to a 14 x 16 foot shelter rarely gave birth inside of that shelter in either winter or summer. We assume that the reason for this was the presence of a dung pile in the shelter and a perception by the female that the environmental stress was too great. When females had access to a 25 x 60 foot shelter, the females always gave birth inside of the shelter despite the presence of two dunging areas within the shelter. We assume that the surface area of the shelter was large enough to allow criation and overcome the females concern for the presence of dung piles.

9. **Stocking densities**: Stocking density refers to the number of animals per unit area. I recommend that farm stocking density be no more than 5 llamas or 7 alpacas per acre of land for grazing to maximize forage utilization and minimize parasite burdens on pastures. In winter, grazing is not an issue for most farms because the animals will voluntarily congregate around hay feeders and shelters. Hygiene becomes a vital concern. Our research has shown that a minimum of 12 inches is required for bunker feeders to allow simultaneous feedings. However, this results in failure to feed by many of the submissive animals. Bunker space of 24 inches per head resulted in fewer submissive animals being excluded. Hay feeder space is equally important. Camelids may spend 8 hours or more feeding on hay each day. If limited feeder space is available, submissive animals will not be able to ingest enough hay to maintain weight and will be more prone to hypothermia.

10. **Parasites**: Often, winter is thought to provide a "reprieve" from parasites that can not survive the harsh cold and failure of eggs to hatch into infective larvae. This is true for most intestinal parasites. However, winter is fertile ground for transmission of some parasites (e.g. coccidia, whipworms, lice, mange, and skin fungus) because of close animal-to-animal contact and diminished hygiene. Heavy parasite burdens cause stress to the animal and may decrease their ability to tolerate environmental extremes.

Treatment of hypothermia involves warmth, nutrition, and correction of underlying problems (e.g. milk supplements for crias whose dam is not lactating). Critical hypothermia occurs when core body temperature drops below 90 F. Consider the following treatments:

1. **Protection.** Get the animal into a well-insulated, preferably heated area.

2. **Warmth**. Wrap the animal in heated blankets. Using a heat lamp in a cold stall can be detrimental because the direct heat causes dilation of the surface blood vessels, which can exacerbate heat loss. By incubating the animal in a warm blanket, heat loss in prevented.

3. **Time.** Avoid too rapid heating. Warming a critically cold animal up too quickly can cause as much harm as the hypothermia because of altered blood flow and liberation of potassium and organic acids that built up during the period of poor blood flow caused by hypothermia. These can cause the heart to stop!

4. **Energy.** Intravenous administration of electrolytes and glucose are most useful. If an IV line is not available, glucose or other carbohydrate syrups (e.g. honey, fructose, and maple syrup) may be fed orally or may be inserted into the rectum. Yes, that's right! Camelids can absorb glucose from the rectum if there is adequate blood flow. All liquid supplements should be warmed to approximately 95 to 100 F.

5. **Oxygen**. Always a useful supplement to debilitated animals, but particularly useful to critically hypothermic animals.

6. **Steroids.** This is controversial because of camelids sensitivity to glucocorticoids. Our research suggests that dexamethasone should not be used in camelids. Prednisone type steroids may be safely used for short periods at modest dosages (e.g. not exceeding 1 mg/kg twice daily for 2 days).

7. **Ulcers**. I recommend prophylactic use of antiulcer medications for high-risk camelids. I prefer omeprazole (2 to 4 mg/kg, orally, once or twice daily).

8. **Nutrition**. Encourage the camelid to eat themselves back to health.

9. **Stress.** Companion animals are always welcome! Treat any underlying disease, parasites, etc.

10. **Recovery.** The effects of damage from hypothermia may not be fully realized for a day or two. These animals must be kept under constant vigil for 3 to 5 days to be sure other complications will not be suffered (e.g. diarrhea, depression, etc.).

Although heat stress is of great concern to camelids residing in North America, cold stress is equally important. Forethought and preparation will help you keep your llamas and alpacas from being caught with their fur coat down!

Article from David Anderson, DVM
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