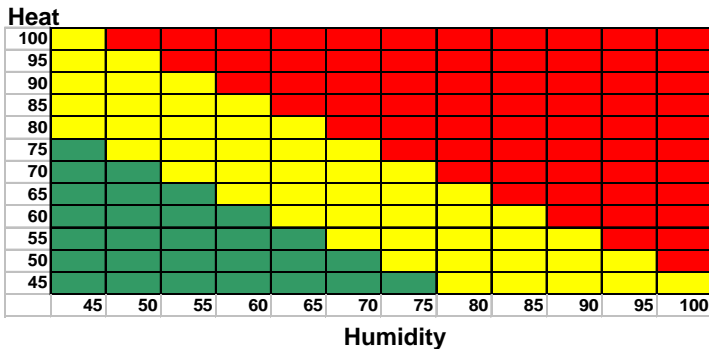


Heat Stress In Alpacas

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As we all know, heat stress is not unique to alpacas. Humans can also suffer from heat stress under extreme conditions and many steps that are taken to reduce human heat stress can also be used for alpacas. However, alpacas faced the additional challenges of having a built-in fur coat that helps retain body heat.

Unfortunately, there are no absolutes when talking about environmentally measuring heat stress. We have heard people use heat stress index (HSI), heat index (HI), the apparent temperature or comfort index interchangeably. None of these terms are specific to alpacas though. The best guideline that we have found is to take the sum of the air temperature and humidity. If that sum is less than 120, there should be minimal risk of heat stress. If the sum is 150 or more, steps may need to be taken to minimize any risk to the alpaca's health. Even using this measure there are plenty of exceptions. What happens when the temperature is 75 degrees and it is raining (humidity is 80%)? What about state locations like Arizona where there is little humidity? So, as with all guidelines, we need to understand



what the measure means on our farms and how to interpret it. As alpaca breeders, we need to become more vigilant as both the temperature and humidity go up in the summer months. The chart to the right provides a visual to show that in some cases heat plus humidity (the red area) can become a concern for alpaca owners. But it should only be used as a guide to alert you to a potential problem.

The good news is that, to a limited degree, alpacas can adapt themselves to operate within a wide range of environments. The problems may occur when the sum of temperature and humidity reaches 150 and above and the alpacas can no longer adapt to the environment. That is when they need our help and assistance the most. If you get an inexpensive temperature/humidity thermometer and place it outside in a non-sunny location, you are ready to monitor this environment condition easily. The areas of the country where alpacas are most affected by the combination of high heat and humidity are on the East Coast and in the Midwest, although other areas are not immune to this. For example, on our farm in the Pacific Northwest, there are occasional spells of high temperature and humidity, even though that is not normal summer weather there.

We recommend that farms review their farm and herd management practices to ensure they are ready, if the need

arises, to deal with heat stress. As important, alpaca owners and breeders need to understand their herd and how heat stress can affect their alpacas in the different stages of their lives.

Know your herd:

- **Temperature check:** During average temperature day, take your alpacas temperature. An alpaca's normal internal temperature range is about 99.5°F to 101.5°F for adults and possibly to 103°F for newly born crias. Internal alpaca temperatures that are in the range of 104°F to 105°F pose a clear and present danger to the alpaca, no matter what the outside temperature and humidity are. Heat stress signs to watch for are open-mouthed breathing, nasal flaring, drooling, depressive or dullness behavior, not eating, scrotal swelling (in intact males), weakness, trembling, a heart rate over 90 beats per minute, or a respiratory rate over 40 breaths per minute. As with humans, the young, old, ill or pregnant can be more susceptible to heat stress and the consequences can be quite severe.
- **Unborn crias & Dams:** Dams have an added risk of heat stress if they are pregnant. The unborn cria can be damaged, without the dam herself being damaged. The critical time for heat stress in an unborn fetus is 1.5 to 2 months of gestation. This heat stress can cause brain and spinal cord abnormalities. It can also result in abortion. A pregnant dam in full, dense fleece should be monitored on hot days. Her fetus may be more at risk than she is. The dam really needs to be shorn before the full effect of hot summer days hits.
- **Newly born crias:** Until a cria has developed physically so that the body's temperature regulation mechanism has matured, the internal temperature can get out of control in warm weather, even when the adults feel no heat stress. Particularly at risk are the colored crias, who absorb the sun's heat much more than the white alpacas. A cria's temperature regulation capability doesn't develop until maybe a month after birth. It may look cute for a 3-week old cria to be lying in the full sun, as the adults sometime do, but the heat stroke danger is there until the cria's system starts to regulate the internal temperature. Check your young crias on hot days, particularly if they are non-white. Pay special attention to their behavior and notice if they are staying in the sun too much or if they are less active than usual. Note abnormal behavior, such as a cria trying to drink urine at the poop pile – a sure sign that it is dehydrated. If the air temperature is hot and/or the sun is intense, take the cria's temperature a couple of times during the late morning and afternoon hours.
- **Breeding males:** Heat stress infertility in breeding males is probably more well-known than the cria heat stress problem. Colored males are at a higher risk than white males. Alpaca testicles are not pendulous (the alpaca can't drop them away from the body to cool them off). When the body temperature rises to about 104°F - 105°F, the

existing sperm in the testicles can be destroyed. It can take from 90 days to one year for the new sperm to be available so the stud can breed again. For many stud owners, that is fully 50% to 100% of their breeding season (and stud fee income!). Even worse news is that sperm production can be destroyed permanently if the alpaca's temperature is above 105°F. At that point you have a prize-winning, pet-quality male.

- **Sick or old Alpacas:** Heat stress adds an additional burden on alpaca's that are already battling illness or age. As such, special care should be taken to monitor sick or old alpacas to ensure that heat stress does not put an additional burden on them.

Herd Management Practices:

- **Shade:** Shade can come in a number of forms. Shade trees are the best type of outdoor shade although run-ins also provide alpacas relief from the sun. Barns or permanent structures should have high enough ceilings in order to provide sufficient air movement. Note that hay stored in the loft of a barn diminishes the barn's ability to cool because the hay will insulate and block heat from escaping. Whatever type of shade is used, be sure that the shaded area(s) can include all of the alpacas as needed.
- **Ventilation:** The most effective breeze should be directed near the floor (without blowing dirt and straw everywhere) so that the breeze can get underneath the animals (where the "thermal window" is located). Barns should also establish cross-ventilation so that fresh air is constantly circulating. Install large barn fans so that they safely pull air from shady cool areas and not from dry sunny areas.
- **Shearing:** Our alpaca's fiber is sheared before we expect the temperature to be 80 degrees for several days in a row. If you must plan in advance for shearing we have found April to be a great month for shearing in Virginia and June in Washington State. Avoid "fad" shearing that leaves the neck and leg fiber on the animal in hot and humid weather, since any fiber will retain the alpacas' heat. If you are planning to show your alpaca, check for the fiber length requirements for the show and decide whether shearing or showing is more important to you.
- **Bedding:** Straw should not be used as bedding in the heat of summer since it will insulate the alpaca and not allow heat to escape through their thermal window when they kush. Plan to replace the straw with earth, pea gravel, or sand for the summer;

An Alpaca's "Thermal Window" is the area on the alpaca that allows them to shed excess heat. The thermal window is an alpaca's belly, armpits and groin.

which will allow more heat to be drawn from the alpaca.

- **Summer Nutrition:** Don't let your alpacas get fat or too skinny! Physically fit animals react better in extreme temperatures than overweight or thin animals. Consider buying feeds that contain additives for reducing summer stress: adequate selenium, vitamin E, copper, zinc, and B vitamins such as thiamine can increase tolerance of hot weather. Eating and digesting hay takes a lot of work and generates a lot of heat.
- **Water:** During the Summer and Fall, water becomes the secret weapon to battle heat stress. The amount of water that alpacas will consume in the heat and humidity may double during the hot summer months. Place water containers in shaded areas or place a shield above the water container to shade it from the sun. Automatic water feeders are great if they draw water from underground where it is cooler, to refill the water receptacle. You may want to offer your alpacas at least one water bucket with electrolytes added in. The electrolytes contain salt, potassium, glucose, and bicarbonate which help replace losses that occur in sweat and breathing. Use this electrolyte bucket as a supplemental source of water and not a sole source since the alpacas may elect not to drink the electrolyte water and want to stick with plain water. The downside of the bucket with the electrolytes is that they should be cleaned frequently to prevent the growth of bacteria.

Alpacas will seek out any body of water to get cool. Some farms consider kiddie pools a great way to allow the alpacas access to water under controlled conditions. The pool should be placed in a shady area. Extended exposure to water may damage the fiber, especially around the legs, but pools are very effective at allowing the animals to self-regulate temperature. Be aware that pools can get really dirty really fast and that the shallow water will heat up to ambient temperature pretty quickly.

We also use a concrete run as a cooling area by watering it down so that the alpacas can kush on the cool concrete. Some people have also placed a soaker hose under about two to three inches of sand to achieve the same effect.

Even if all of the above methods have been used, something more proactive may be called for. We've had good success in bringing the alpacas into a shaded area and spraying their legs and belly with a gentle spray from our garden hose. They loved it! They voluntarily turned in circles in front of us to make sure that they got sprayed all the way around. Then they got to kush on the wet grass or on a concrete floor with fans circulating the air.

We've heard of inventive variations – one owner picked up his young cria and walked with it into a pond to cool the cria down quickly. You can get the same kind of effect with a bathtub of cool water.

Farm Management Practices:

- **Breeding:** Consider timing your breedings and birthings so they don't occur during the hottest months
- **Weaning:** Separating a cria and dam is a stressful time for both. If possible, it should be delayed so that it occurs during cooler weather
- **Halter Training:** Training increases an alpacas stress level and should be moved to cooler months if possible or given in shorter doses during the early morning or evening hours is during a heat spell.
- **Transporting from cooler to warmer climates:** Try to avoid transporting alpacas to an unaccustomed hot climate during summer months. It may take several months to acclimate alpacas to a new geographical area, feeding practices and herd mates.

Conclusion:

Alpaca owners and breeders can take many steps to ensure their alpacas remain healthy and safe during the summer months if they practice practical prevention and awareness. However, the best person to consult if you suspect alpaca heat stress (or any alpaca illness) is your veterinarian. As breeders, we rely on them to provide us expert advice on how to care for our alpacas. Consult a veterinarian at the earliest time for animals showing abnormalities of behavior during summer months. Or better yet, talk to your veterinarian before the summer months arrive and get a jump-start on your hot weather plans.