

Summer Crias and Dehydration: Prevention, Management and Treatments

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Introduction

The mid-summer calls are rolling in to TimberLake Farms: “*My alpaca had a normal birth a couple days ago and today the cria isn't looking very good. It's really hot here! What do I do now?*”

Here are suggested prevention and management heat/birth issues you need to read, think about, but most importantly understand. Even better, prepare before any summer births. We also strongly suggest talking to your local farm veterinarian about the special needs of potentially heat stressed summer crias before any births.

How bad is the problem?

With some specific geographical exceptions, summer-born crias have a very difficult time with high heat. Coupled with difficulty in thermoregulation and dehydration, this stress to the system often results in blood hypovolemia and death. The comments below generally relate to those crias where heat is an issue and not those few locations where the summer is rarely hot.

In terms of mortality, many of these heat stressed summer crias have about the same survival chances as a cria born in bitterly cold mid-winter. Yes, 50% or greater mortality is to be expected with no intervention. Even with prompt interventions, there are no survival guarantees. The key is understanding, good management and prompt responses when a problem arises.

How does this happen?

First, let's review the issues and describe how, where and when this happens. For the majority of owners, the dam was purchased bred from a farm where summer cria births are tolerable or where they have the facilities to support these hot weather births and the dangerous even critical neonatal period. For a few others, the delivery was a surprise, the result of an “oops” summer breeding last year.

For many new alpaca owners, the excitement of the purchased alpacas and the thoughts of the additional herd growth and crias overshadowed the later and looming management difficulties. Then, the birth occurs and problems arise – problems that nobody told you about!

Where does this happen?

First, let's consider where these dangerous hot and humid summer areas are located. The specific geographical issue is not the issue, rather the conditions. If your daytime summer

temperatures are hot and humid (daytime temps above 90 degrees F and the relative humidity more than 40%), then you are in a dangerous problem area.

We advise using the combination of heat and humidity as a danger “index”. If the sum of these two values (heat and humidity) is greater than 150, then you have a problem. The danger increases markedly as this number goes up. This is because heat stress develops even at lower temperatures (80 F for example), but with 70% humidity. This number should be lowered to perhaps 130 when there is little breeze.

There are relatively few geographical areas where this is not an issue (Colorado/western mountains, Pacific NW, etc), but we suspect that 90% of USA alpaca owners are in the hot and/or humid summer areas. These areas certainly include New England, mid-Atlantic, the upper/central Midwest as well as the traditional hot areas of the mid south, deep south and far southwest. That being said, owners need to be aware of a sudden hot spell in an area that is historically moderate in terms of heat and humidity. . in other words – most of the USA

Is pregnancy the problem?

Can alpacas give birth to a healthy cria in these areas and in these conditions? With shearing, shade and misters, the metabolic heat of late pregnancy can be controlled and a healthy cria can be born. Moderate heat/humidity, pregnancy and delivery don't generally pose a large risk to the cria. However, a distinct heat spike is well known to initiate a premature delivery with that set of problems on top of the weather. Rather, with a normal full gestation birth, the immediate post partum dehydration, temperature control, diarrhea and infection loom as the cria's daunting health issues.

Critical Navel Care

There are substantial similarities and yet important differences between a southwestern 100 degree F heat, 5% humidity and breezy conditions contrasted to a dead calm 88-degree heat in the northeastern areas with 75% humidity. Both situations result in dehydration, perhaps faster in Arizona than New York even if it does not feel that hot in the southwest due to evaporation. However, with the higher humidity comes the issue of navel infection – something rare in the drier areas. In either case, a dehydrated cria's barely active immune system is under stress, and bacterial navel infections often follow.

South America Altiplano vs. USA Conditions

In the South American high mountain altiplano, crias are born in areas where it is warm in the daytime, then briefly hot for a couple hours. With nightfall, air temperatures plummet often by 40-50 degrees F as there is very little humidity. Away from the lower elevation bofadales (water holes), there is very little morning dew and the ground dries off quickly in the morning if there is any moisture at all. Contrast this with our heat/humidity where the grass remains moist until late morning! This is a critical area regarding navel care and subsequent infections. The high mountain areas are also barraged by intense UV light – an issue that kills bacteria on the soil surface. Let's consider the issue of navel care first.

Immediate Birth Care

At birth (not two hours later), the umbilicus **MUST** be dipped in disinfectant (iodine, chlorhexidine, etc). We prefer iodine, as it is red, making it easy to see that the navel area is covered. The cria and then dam are then transported to a bonding area. This prevents last years cria from nursing on mom. The staff floor includes a mat or other clean and dry material for the dam and cria. We prefer stall mats as this loose woven loose polypropylene material allows urine to pass through and the manure “beans” are easily raked/swept off. Recall that bacteria need three things to grow: 1) darkness, 2) moisture, and 3) warmth. All three are present under a cria's belly as it is sleeping snuggled next to the dam. The summer ground surface is loaded with bacteria and low altitudes don't have the intense UV that kills bacteria, as does the altiplano.

We disinfect the navel twice a day for the first several days until it is dried up like three-day-old spaghetti noodles (crispy and stiff). With the umbilical stump remaining dry, the risk of navel infection is markedly reduced – unless it rains and the cria is out on wet ground. We don't let the cria out on any damp dew covered or rained on grass until the grass is dry and there is no moisture.

A Life-Saving Oral Vaccine

We are strongly advocating that all crias (regardless of time of year) get an oral vaccine for e-coli and clostridia C antitoxin immediately at birth. This largely prevents diarrheas (scours). This is a highly used issue in the dairy industry where all calves get this oral treatment. Steve learned this management issue several years ago from Connie Bodeker, a superb Suri breeder in Minnesota. Dr. Rob Pollard, an experienced California camelid veterinarian, also is emphatic about giving this oral vaccine at birth.

Novartis makes a bovine (calf) oral vaccine (“Ecolizer +C”), sold for under \$10. This can be used with crias. Each 10 ml tube treats two crias. Just shake well before giving it. This management trick is inexpensive, easy to give, has very few complications and eliminates many expensive and common cria problems.

This oral vaccine immediately protects the cria as the vaccine is given early – we prefer to give it even before the cria has nursed for the first time. This will reduce the chance of developing diarrheas and other infections the cria might pick up from warm moist ground (pathogenic e. coli and soil borne clostridia infections).

Data from Novartis suggests that for every hour after birth you wait, that the absorption of this oral vaccine by the crias gut is significantly reduced. Accordingly, this treatment is likely only effective if given within the first few hours of birth (12 hours maximum).

A Cool Environment Must Be Provided

The dam and cria must be moved into an air-conditioned area. Yes, this may mean the house, living room or garage with the air-conditioned house doors into the garage left open, etc. The key is to get both the air temperature and humidity substantially lower than the outside environment. Ideal temperatures perhaps might be mid-'70's F with a relative

humidity of 35-45%, but any lowering of temperature/humidity is better than the outside conditions.

Air conditioning does NOT mean an evaporative cooler, sometimes called a “swamp cooler” in humid areas or a fan in the corner of the barn stall. Evaporative coolers work very well when the relative humidity is very low (less than 20%), but only adds moisture to a situation when the humidity is high resulting in no cooling.

For the house or garage - several stall panels, plastic sheeting for the floor, a stall mat and you are in business. Difficult? Hard to do? What will people think? Well, just what is the value of your cria?

The above three issues (navel care, oral vaccine and air-conditioning) when provided for early on will substantially decrease risk for death, but care must continue for some additional time.

The first 48 hours after birth are absolutely critical in these hot areas. After that point, you can let the cria out for an hour or two in the evening when it has cooled off, but return the dam and cria to the air-conditioned stall for the night. The amount of time out and in clearly depends on the degree of heat and humidity in your specific area. Then, after the third or fourth day, you can let them out for more time in the evening putting them back in after a few hours – but watch out for dew/ground moisture (navel issue)! Then for a couple more days, keep the cria out of the worst heat, which is generally from about 10 AM to about 6 PM when the heat and humidity are highest. After a week or so, you can allow the dam and cria to be outside with the rest of the herd.

The Issue of Temperature Regulation and Dehydration

Newborn crias do not regulate their body temperature well. The brain hypothalamic sensors that adjust skin blood flow, heart rate, shivering and other metabolic issues have not yet adapted to life outside the temperature adjusted uterus. In addition, because of their small size, high air temperatures will heat them up much faster than their larger dams.

Measuring rectal temperature is absolutely necessary so you need a digital thermometer and a bit of KY jelly or other lubricant. Rectal temperatures greater than 101.5 F need intervention quickly and anything more than 103 F is critical. Oddly, dehydration can also result in low temperatures, so watch out for that as well (less than 99F). We suggest that you measure the temperature every several hours for the first post partum day and then twice a day after that going down to once per day when the cria is fully outside perhaps for a couple of weeks. But if after this period, you get a hot spell, be ready to measure those temperatures!

Urination as Misleading Hydration/Fluid Status

Dehydration is the killer of summer crias. Fluid loss from sweating, urination, respiration and even worse - diarrhea (the reason to give the oral vaccine) will weaken a cria and it will soon die.

Sometimes people mistakenly say, “*My cria could not be dehydrated as I have seen it urinating.*” This is a management mistake as dehydration can easily occur even with normal urination.

“*But the cria is nursing – isn't this a good source of fluids?*” Here is the problem. The dam's first milk (colostrum) is very thick with immunoglobins and other proteins. Resultantly, it does not have the higher water content of later milk. With summer births, this concentrated protein (yet water deficient) colostrum milk comes at exactly the wrong time as fluid losses from summer crias are much greater than with crias at cooler times of year.

Many summer crias are weak and are immediately weakened by the elevated temperatures in the first hour or so after birth. Failure to promptly nurse only further weakens them and adds to the loss of body energy. Little energy leads to a further inability to nurse and get life saving colostrum. This now become a full cycle, and without intervention, results in cria death.

Meconium and Enema Issues

Dehydration can also cause meconium to become very hard. Normally, this fecal “plug” (sometimes bluish or greenish color) is expelled soon after birth. However, if any dehydration set in, fluid losses leave the plug quite hard (much like modeling clay left out for a couple of days). Retained meconium often causes cria to stop or slow down their nursing.

The solution to this hardened meconium is to give a mild enema. We use a feeding tube and a 50/60 ml syringe with a tip that fits the feeding tube. Gently insert the feeding tube perhaps a couple inches into the rectum. Give the enema fluid slowly (1 minute). This fluid is made up as a mixture of warm water and glycerin (25 ml water, 5 ml glycerin; about 5:1 – not a critical ratio). The total of about 30 ml is given and hopefully, the meconium plug will soon be produced.

This treatment can be repeated hourly, but if nothing appears after two enemas, then a veterinary visit is appropriate. Not every cria needs this, but often-dehydrated crias are “bound up” and for unknown reasons, they tend to stop nursing.

Failure of passive transfer (colostrum issues)

Failure to nurse also causes failure of passive transfer (FPT). Passive transfer is the manner by which the crias gets the “priming” immunoglobins from the mother's first colostrum milk. This must occur in the first post partum day and preferably in the first few hours of the cria's life. This is the only way crias get infection fighting immunoglobins. Failure to get colostrum sets up the cria for infection several days after birth. Thus, summer births in hot weather get into many issues!

Weighing Crias

It is critical to measure the cria's weight with an accurate scale twice a day. We prefer and recommend inexpensive (~\$25) electronic (battery operated) fish scales available in the

sporting goods area of many stores (Wal-Mart, Target, etc). A laundry mesh bag is used to “bag up” the cria (who can see the dam and vice versa through the mesh holes). The fish scale “gill hook” is attached to the mesh bag handles for weighing.

Many fish scales weigh down to the gram (1/30'th of an ounce) and have a very clear LED display. Although this degree of precision is not necessary, it is important to get the weight to the ounce. Weighing at a consistent time of day is important and make notes if the cria has just nursed or just urinated. This can allow you to monitor the hydration state of the cria as gaining weight is probably a sign that the cria is nursing and getting appropriate fluids.

Oral Rehydration Solution

Another mandatory addition to your farm first aid kit is “Pedialyte” or other similar over the counter (non-prescription) fluids. These are “oral rehydration solutions” given to human babies when they are sick or vomiting, but they work very well for crias. These fluids can be purchased at any pharmacy and in many grocery stores. They contain fluids, minerals, electrolytes, vitamins and some sugars. “Pedialyte” can be a life saver for a dehydrated cria, especially if the veterinarian is delayed getting to your farm.

You can give about ten ml at a time of Pedialyte by mouth with a syringe (no needle!) to prevent further dehydration while you get other issues organized or while waiting for the veterinarian. This can be done several times as you wait. Another approach is to also give ten ml of this solution rectally as an enema. However, the best solution is to prevent dehydration in the first place! Note that this small amount of oral fluids cannot correct a several hundred ml loss of body fluids in severe dehydration.

Tube feeding can also be done. This requires that you are familiar with this technique. Although not difficult, many people are scared as they feel they can deliver fluid into the lungs. When properly done, this worry is not an issue. This is another technique that your vet can show you.

Detection of Dehydration

How do you detect dehydration? Do not wait until the classic limp and listless cria is seen. Far better is to detect dehydration before it is this far along. You need to understand and know the feel of “tissue turgor”.

Turgor is the elasticity, suppleness or osmotic water concentration in the normal skin tissues. One excellent place to check this is to gently pinch the thin skin below the eyes. Upon release of your fingers, the skin should normally spring back quickly to a flat state. If it remains “tented up” (like modeling clay) then you likely have dehydration.

One way to educate yourself is to test turgor in normal alpacas so you know how to recognize later dehydration when you need to. Get help from your veterinarian to show you what “normal” hydration feels and looks like in both a healthy cria and adult alpaca.

A dehydrated cria is often just behaviorally “different” before any specific signs are seen. You should be alert anytime something that doesn't seem right. When you see something “not right” take a few moments to consider all the options on what might be going on. At

times, I need to talk this over with another trusted friend, as sometimes I do not see the obvious. In the summer, with heat, the obvious issue you should immediately think of is dehydration or one of the linked problems.

Dehydration can hit a cria hard and fast. We often hear, “*She was running around this morning looking great and now she is limp as a dishrag*”. At this point, the cria has “crashed”, the cardiovascular system is compromised and there is little defense against any infection. Opportunistic infections often appear. This cria needs veterinary attention within the hour!

Methods of Fluid Delivery

Your veterinarian will have fluids ready to administer. Intravenous (IV) fluids are the best, but sometimes it is very hard to find a small collapsed vein in a dehydrated cria. Fluids delivered under the skin sub-cutaneously (sometimes called “by clysis”) are another alternative. These clysis fluids can add in the necessary fluid volume so that a later IV can be placed.

Your vet will know what fluids to give, but these include lactated Ringer's, or other electrolyte fluids that contain appropriate amounts of sugars (dextrose) and more than just sodium and chloride (saline). I would encourage all of you to have the necessary equipment to give fluids under the skin (syringes and needles). Your vet can show you how to do this especially if veterinary help is a few hours away.

Dehydration causes many systems to shut down and, after rehydration, you may need to give appropriate sugars by mouth (oral Karo syrup is excellent, NEVER honey). Further discussions rapidly get into professional veterinary assessment and treatment. When a cria is dehydrated, death is imminent!

Establish guidelines with your veterinarian on how much fluid to give a cria. How much and how often you give fluids will depend on how the cria is doing. Recall that a 15 lb cria only has a total blood volume of about 500 ml (two cups – 16 oz). Thus, giving 350 ml IV too quickly can cause other problems cardio-pulmonary problems (heart failure and/or pulmonary edema). More IV fluid, too quickly is NOT better! Slow, steady and moderation is the key with IV fluids. Always check with your vet to be sure of amounts, rates and fluid composition.

Anytime a summer birth is expected, you need to be very vigilant and also have your veterinarian ready for an at risk cria. The delivery will generally go smoothly – the problems only start from there. Being prepared also does not guarantee success.

Summary and Conclusions

We have consulted with several farms that have had June - August crias with the dams and crias in cool basements, in cooled garages and even in the air-conditioned living/family room (brings life to that word “family”)! All crias are now doing well and are out with the dam and the herd. But it was a lot of work and stress.

To a person, all owners have said that they will hold their dam over for a few months to re-breed in the fall to avoid this situation. They all wished they had NOT had a summer birth, will NEVER allow it again and encourage all to consider the wisdom of this birth time. The veterinary and consulting costs were substantial, the disruption to farm life significant and the stress hard to take for all.

Let's learn not to have summer crias in areas where they are at high risk for dying.

This is a chapter from the *TimberLake Farms Alpaca Management Book*, which is currently in progress. This issue is also discussed at [TimberLake Seminars](#). TimberLake Farms is available for consulting and help on your farm. Call Steve at the farm (405 341 8444) or cell (405 550 3023) for specific details. E-mail (steve@timberlakefarms.net).