

Winter 2021

# *The Journal of RMLA*



**RMLA**   
Rocky Mountain Llama and Alpaca Association



# Welcome to RMLA!

— — — Mission Statement — — —

The mission of the Association shall be to educate the members and the public as to the breeding, raising, care and use of llamas and alpacas.

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## About the Journal

The Journal of RMLA<sup>®</sup> is a quarterly publication of the Rocky Mountain Llama and Alpaca Association (RMLA). The RMLA Journal Committee and the Board of Directors reserve the right to select and edit all articles and advertisements submitted.

The information in The Journal is not intended to be a substitute for qualified professional advice. Readers are encouraged to consult with their own veterinarian, accountant or attorney regarding any questions concerning their animals or business operations.

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## Journal Submission Dates, Ad Rates & Specifications

Issue	Submission Deadline	Publication Date
Spring	February 28	March 31
Summer	May 31	June 30
Fall	August 31	September 30
Winter	November 30	December 31

Ad Type	Width x Height	Member Rate	Non-Member
Business Card	3.5"x2"	\$ 7	\$ 15
¼ page horiz.	7.5"x2"	\$ 12	\$ 24
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Ad rates are quoted per issue. Lock in the current rate by purchasing an ad for four consecutive issues and receive a 5<sup>th</sup> ad for free. You may change your ad once during the year.

### To submit articles, ads or photo:

- All submissions go to [rmlaeditor@gmail.com](mailto:rmlaeditor@gmail.com)
- Documents in MS Word format
- Camera ready ads as a pdf file. **NOTE:** What you send is what we publish.
- Images/photos as .jpeg (.jpg) or .tiff files. Photo from a camera or phone are sufficient. Please check the background and lighting. RMLA will crop for fit and/or enhance the lighting.

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Payment and ad copy must be received prior to submission deadline. See the table above for dates.

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## RMLA News from Your Board

Happy New Year as we welcome in 2022! First and foremost, to every one of our members, we appreciate your tremendous efforts and support of your RMLA organization. Without our treasured members – your ideas, energy, and efforts – there would be no need for an RMLA Board of Directors. With our alpacas, llamas and one another in mind, your Board continues to do our best on behalf of all.

Thanks so very much to the members who have contacted us in support of the Board's decision to move to an electronic Journal. The "great idea" excitement, positive comments, and thanks the Board and Journal staff have received has been amazing and most encouraging.

We celebrate this first ever Journal of the RMLA delivered electronically! And isn't the color beautiful! We are now able to deliver you an unlimited number of pages without printing, postage, and other costs. Enjoy the fresh look of our Journal as you scroll through the pages. We join other organizations in our efforts to conserve the earth's natural resources while bringing you more educational and informative articles than ever before.

Let's bring you up to date since the last Journal.

- The most exciting development to report is the new RMLA.com website, which has been under construction for a year, with fantastic member participation. In a few short weeks, we hope you will be able to visit your new website and totally explore it. It will contain so many things for our members to enjoy and use. Some aspects will still be under construction, and we appreciate your patience as we complete this monumental project.
- One of the highlights of the new RMLA.com will be a fantastic new benefit for you to use in promoting your farm/ranch, your interests, and talents. The new Featured Member section will allow you to share with the world your beautiful animals, fiber, packing, and other lama interests.
- From the Bookstore, a 4H club in Wisconsin has purchased 50 Youth Manuals for its Youth. Congratulations to this group for having a large number of youth who are interested in Camelids. We have several 4H clubs in Northern Arizona that are interested in the Youth Program. Please see how you may help youth in your area become an RMLA Youth and thereby take part in the RMLA Youth Awards Program.
- Have you noticed the new appearance of RMLA e-Blasts sent to members? Sandy Schilling has redesigned the look of e-Blasts with branding RMLA in mind as we communicate with members. Please remember that opening your emails is important to keep you informed as to what is going on. You will receive four e-Blasts a year from RMLA that will contain a link to your quarterly Journals. Sandy has worked diligently to assure that our complete list of members' email addresses is correct so that every member can be contacted.
- An additional heads up. With the completion of the new RMLA.com you will receive email notices when dues are due. It will be so easy for you to renew. Now, a membership will begin on the day a person joins or renews, be it April, October, or February. Interestingly, the programmers refer to membership as a subscription.

We passionately believe that involvement is good and builds a strong organization. You, your talents, and knowledge are important to other members in RMLA.

Make 2022 the year to become more involved. Let us get energized in the months to come.

As always, contact any Director for more information. Enjoy scrolling through the first edition of the new electronic Journal.

On behalf of your Board,  
Lougene



## From the Editor

There is nothing like a camel ride to get your juices going. The gait of a camel is unique... was I able to ride one of our llamas, I might feel a similarity!

Welcome to the first eJournal of the RMLA. Changing to this format has been another unique experience. But I am loving it and am awestruck when I open the Journal to all of the beautiful and colorful photos sent by our members.

This issue is filled with many educational articles; three from Ask the Vet questions and one from our Research Chair on COVID cases showing up in 4-leggeds. Plus, our members with their animals have begun to get active in their communities again. A parade, a fiber event, and a public relations event are all featured in the issue. And, we have two events scheduled during the next several months. Take note: RMLA is about education but we are also about FUN! As we move forward, there is excitement in the air.

A few weeks ago I came across an article in my email about a Camel Beauty Pageant in the United Arab Emirates. I love learning about other cultures, especially when camelids are at the forefront. Attempting to gain reprinting approval from the New York Times became difficult so I recruited Ron Baird to track down the author to gain reprint permission. Ron spent several weeks trying to track down the globe-trotting photojournalist, Kiki Streitberger. After several rounds of questions and answers between Ron and Kiki, RMLA was granted permission just as I was

wrapping up this issue. "Hold the presses" came the call to me. I did and you will find this fascinating article and amazing photos at the end of this issue. A huge Thank You to Ron Baird for his persistence.

I look forward to hearing from many of you. In the meantime, stay safe and stay well. And enjoy your animals.

Kathy Stanko, Editor  
[rmlaeditor@gmail.com](mailto:rmlaeditor@gmail.com)

**Cover photo:** Candido at Wild Birds in Bozeman, MT.  
Submitted by Susi Hülsmeier-Sinay.



**Truly Amazing**

Is what the volunteers & contributors of Southwest Llama Rescue can accomplish.  
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SWLR is a 501(c)(3) non-profit organization supported 100% by donations. Ad paid for by SWLR



## Welcome New Members!

RMLA is always growing! We welcome the following new members:

Kathleen & Alexis Knight, Rifle CO  
L'illette Vasquez, Kerrville TX  
John Myers, Greenwood Village CO  
Beverly Lyon, Florissant CO  
Brindy and Stephen Arnett, Chandler AZ

### RMLA EVENT

## Prescott Arizona Christmas Parade

By Linda Hayes  
Prescott Valley, AZ

Members of the RMLA took part in the annual Christmas parade in Prescott, AZ. The December 4th event was watched by an estimated 2,500 people. It is one of the biggest attractions of the year in Prescott - Arizona's Christmas City. This year the parade theme was **It's a Who-Ville Christmas!**

Twice during the parade, the announcer explained the difference between llamas and alpacas to the crowd. They also explained their common uses. There were two alpacas and six llamas decorated to match the parade theme: Who-ville. Our newest RMLA members, Brindy and Stephen Arnett, brought their two llamas, four kids, and two Bernese Mountain dogs all the way from Chandler, AZ. Stephen also dressed as



Sandy Schilling & Linda Hayes

the Grinch and was our parade's bean scooper. He was a big hit with the crowd.

Karen and Bubba Freund from Chino Valley, AZ arrived with four llamas, decorated carts and extra helpers to increase the size of the RMLA entry. RMLA board members Sandy Schilling and Linda Hayes also took part. Sandy brought two of her alpacas and Linda led a llama in the parade.

With temperatures close to 70 degrees and the sun in full force, it was a fun way to share llamas with the public. Plans are already being made to do it again next year. Enjoy the photos. Thank you RMLA for sponsoring this event.











## A Letter of Thanks

Thank you so much for the gift of appreciation that I received last week. The sculpture of the llama from Henry Rivera is magnificent and it is now “living” in the great room of our new home in Big Sky, MT. I am sure that it will draw a lot of attention and bring me wonderful memories daily.

I really cannot fully express how rewarding and meaningful working with the RMLA has been for me over my career at CSU. While I have met some of you in person, I know that there are many more members that I have not met directly, but still hopefully helped in some way over the years. Working with Kathy, Lougene, Ron and the rest of the RMLA board with the “Ask The CSU Vet” column in the RMLA Journal was an enriching experience. I learned so much from your questions and it also helped inspire many of our interns and residents to engage with producer groups in providing help and information to deal with the many common, rare, and new llama and alpaca health conditions that come along. My work with the RMLA will always be one of the most treasured parts of my veterinary career.

Thank you all for your friendship, kindness, support, and wonderful memories.

Sincerely,

Rob Callan, DVM, MS, PhD, DACVIM  
Emeritus Professor  
Colorado State University  
Department of Clinical Sciences  
Fort Collins, CO 80523

## Estes Park Wool Market Is Back

Estes Park has announced the return of the Wool Market in 2022. Educational classes are scheduled for June 9<sup>th</sup> and 10<sup>th</sup>. Events to be held June 11<sup>th</sup> and 12<sup>th</sup>. Go to the Wool Market link to check for the latest information and to register for classes. Thank you Chris Switzer for bringing this news to our attention.


A note to fiber enthusiasts: the classes fill up very fast!

<https://www.estesparkeventscomplex.com/wool-market.html>

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**\* ALPACA & PV FLEECES**

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## Ask the Vet: Vaccinations

Rachel Oman DVM, MS, DACVIM  
Assistant Professor  
Colorado State Veterinary Teaching Hospital

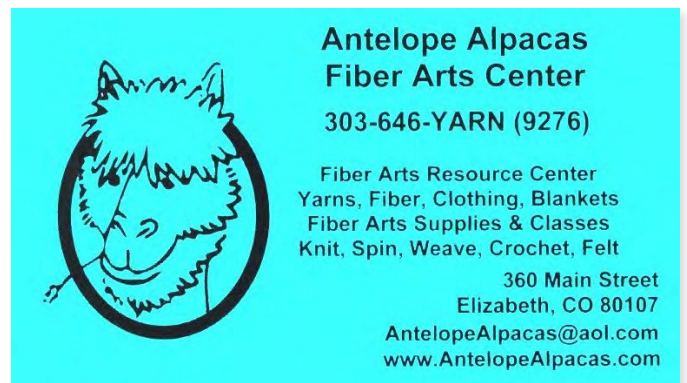
### Do we need to continue vaccinating older llamas and alpacas?

Unfortunately, we don't know enough about vaccination response and efficacy in camelids to provide an evidence-based answer to this question. There are currently no vaccines labeled for use in llamas and alpacas. When we use vaccines like rabies or *Clostridium perfringens* type C&D and tetani (CDT) in camelids, we extrapolate the dosage from other species.

This situation leaves us with some gaps in our knowledge. For example, what level of antibody response can we expect following vaccination with a given product? What antibody level is needed to protect against disease? How long will the antibody titer remain above the protective level before requiring a vaccine booster? There is limited research in these areas for camelids. One study showed that administration of three doses of a West Nile Virus vaccine generally resulted in virus-neutralizing antibody titers similar to those observed following two doses in horses, but the study did not investigate whether that titer was protective against clinical WNV disease in alpacas or llamas.

Given the uncertainty surrounding the level and duration of protection provided by vaccines in camelids, we must rely on other factors to help us decide when to vaccinate. You may want to discuss with your veterinarian the risks vs. benefits of vaccinating animals that may have protective antibody titers already or are at low risk of developing disease.

Some of the factors to consider include likelihood of encountering the disease or pathogen (regional prevalence of disease, animal travel on and off the farm, recent outbreaks, history of disease on the farm, etc.), susceptibility of animals to disease, reproductive status, and contact with the public. After considering the risks and benefits of vaccination, you and your veterinarian may decide to forego an annual booster in a low-risk animal. Hopefully soon we will have a rapid on-farm test to determine if your llama or alpaca has a protective antibody titer prior to vaccination. Until then, the general recommendation is to continue to boost vaccines, even in older animals.



## Upcoming RMLA Events

By Mary Wickman, Events Chair

If you are unable to participate in RMLA events, show your support by attending these very fun events.

**National Western Stock Show, January 7, 8, and 9, 2022.** National Western Complex, Denver, CO. Classes include fiber, performance and halter. The ever popular “Afternoon with a Llama or Alpaca” will be held on Saturday. For more information and/or to volunteer, please contact Show Superintendent, Judy Glaser, [judy.glaser@yahoo.com](mailto:judy.glaser@yahoo.com)

**PacaBuddies, February 12 and 13, 2022.** Douglas County Fairgrounds, Castle Rock, CO. Local group of alpaca breeders bring the alpaca experience to the general public plus showing and selling the products from their fleece. For more information contact Ron Hinds & Elizabeth Cline, 303-646-1320 or [alpacaron@gmail.com](mailto:alpacaron@gmail.com)

### Save the Dates

Planning an event, but, the paperwork is incomplete? Send information to [rmlaeditor@gmail.com](mailto:rmlaeditor@gmail.com) and we will let members know to Save the Date.

## A Letter of Appreciation

From Susi Hülsmeier-Sinay, Sept 14, 2021

Hi all: Since I messed up my participation yesterday at the call-in RMLA meeting, I would like to express my gratitude and appreciation here of the tremendous work that you put in to keep RMLA not only running smoothly but taking it to the next level in regards to website, journal and event management.

It is not easy to keep people engaged and participating. A lot of time and energy, learning curves and hope go into these projects and we are lucky to have people at the helm of our organization that have the skill and dedication to make it all happen for us, our animals, and the public.

I know from experience how hard it is to keep an organization going, including its publication. A long time ago, I was the editor and producer of the newsletter for the Northern Rockies Chapter of the ILA and basically wrote most articles, did the illustrations and took the photos, then added articles reprinted from other journals. That was before websites. So I realize that you take on so much more these days, in addition to all the events and worries in your personal lives.

So I want you to know that at least this member sees what you are doing and doing so well! I wanted to support you all by “showing up” but alas, my brain failed me this time. Know that it was not for lack of wanting to be an active part of this very worthwhile organization. I look forward to the minutes and will get back with articles soon.

Thank you!! Susi



## Triangle Loom Weaving

by Nancy Wilson

Camp Verde Llamas

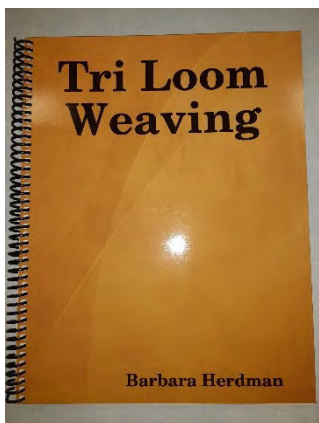
Have you been thinking about adding weaving to your fiber repertoire? There are lots of ways to do that. For a good overview of options, check out any issue of Interweave Press's new magazine called *Little Looms*. You'll see a variety of different styles of looms, such as: pin looms, inkle looms, rigid heddle looms, frame looms, etc. In this article I'm going to tell you a little about triangle looms.

Triangle looms are frame looms that have finishing nails on all three sides. They are a right-angle loom with two equal sides and a hypotenuse. They come in various fixed sizes as well as adjustable sizes. I have a three-foot loom. I took a class at Taos Wool Festival years ago and decided on this size because it fit my budget. More importantly, it fit in my space. If you are a woodworker or know someone who likes to make this sort of thing, there are plans or videos that will provide information. I am not handy that way.

Triangle looms use what is called a continuous thread process. This means that you only use one yarn and don't have to measure it ahead of time.

You can find charts on the computer about how many

yards of yarn different size triangle looms need. If you're a book person, I highly recommend a book by Barbara Herdman about triangle loom weaving. Even though it was written some time ago, the information is very helpful and shows a variety of techniques. It's a great reference tool, and the spiral binding makes it easy to keep close at hand while weaving.



So, enough background. Let's talk weaving on a triangle loom. I support the hypotenuse along a table edge and prop the point in my lap. I've also hung my loom from a piece of grid wall as well as used an easel. Find what works for you. Play with different gauges of yarn, or weave with two yarns held together.

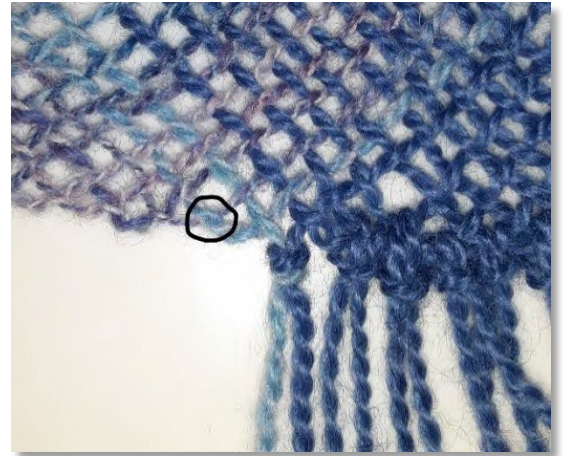
Start weaving by creating a slip knot and attach it to the left-hand most nail on the hypotenuse. Then bring your yarn across the loom to the other end of the hypotenuse. Wrap the yarn around the nail counterclockwise and then take it around the first nail on the right-hand side of the triangle. Take the yarn back to the left hand side and wrap it on the second nail of the hypotenuse in a clockwise direction. Pull a loop under the first strand of yarn and then wrap it around the second nail on the left-hand side. Walk the yarn across the hypotenuse and wrap around the second nail on the side. Use your fingers to lift up the yarn above to pull down a loop and attach it to the next nail on the side. At some point, you'll want to use a crochet hook to pull down loops. Continue in this manner until you get to the middle of the loom. When you reach the last nail, you'll cut your yarn long enough to go from the hypotenuse to the point. Be careful not to pull the yarn



too tight as you progress from left to right, as this will make it difficult to weave as you get close to the center. Check out YouTube for videos on the process. It's much easier to watch the process than to go from reading.

I have been making small shawls with my loom. I weave a triangle and remove it from the loom. I know what you're thinking, "Why doesn't it unravel?" There are two tasks in removing the piece from the loom. First, after the weaving is finished, you remove the loops from the hypotenuse by removing the first right-hand stitch with a crochet hook. Then you remove the second loop with the crochet hook and slip the first stitch over the second stitch. This is reminiscent of binding off in knitting or creating a single crochet.

The second task in removing the piece from the loom is to attach fringe if desired. To create fringe, cut lengths of yarn twice the desired final length. Fold the piece of yarn in half and pull it through the crosses (see circled area in photo) at the edge of the remaining two sides. The piece can now be fully removed from the loom. The reason it doesn't unravel is because the weaving process has you pulling loops down from the hypotenuse to the other two sides of the triangle. You warp and weave at the same time. I then use a circular knitting needle (a 29" size 9 needle has worked well) to pick up stitches along the hypotenuse.



Then join in the round, being careful not to twist stitches. Knit in stockinette stitch (knit every round) for about two inches and then bind off. This gives a nice rolled edge. What I like about this shawl is that it keeps the shawl in place on your shoulders. Three feet is just enough to keep your shoulders comfy.

Happy weaving!





## Leasing Program Offers New Opportunities for Youth

By Morgan Barba  
Chair, RMLA Youth, 4-H, FFA



**Morgan (center) helping Emma (Left) with Charlie.** Emma leased Charlie from Morgan Barba as part of the Adams County 4-H Leased Animal program.

One of the great things about organizations such as 4-H or FFA is the opportunity to give members who may not have the ability to have large animals a chance to work with them through a leasing program. There are many benefits to offering a leasing program to youth, specifically with llamas and alpacas. This year, my family and I had the opportunity to lease two llamas to 4-H members in Adams County. These opportunities can be genuinely reciprocal relationships; there are benefits to leasing your llama to youth members and for the youth member leasing the llama.

The first benefit for a youth member leasing a llama is the minimizing of costs and time. Owning a llama can be expensive and if a youth is unable to keep a llama on their property, leasing is an economic alternative. For us personally, when a youth leases a llama, the equipment that is needed to show a llama is already included, further reducing the costs. Leasing llamas also help to test owner readiness. Some of the youth who have leased from us have expressed interest in owning a llama of their own, and leasing lets them and their parents test the waters of ownership. Leasing is a time for discovery and to gain first-hand knowledge from the owner about what it takes to own and show a llama. For me

personally, it is always exciting when I get to share my knowledge with others about raising and showing llamas, especially now that I am no longer a youth member.

Furthermore, leasing can help youth reach their goals. Some youth set goals to win showmanship to become better in the obstacle class during performance. Whatever the goal they set for themselves, youth can better reach these goals by using an animal who may already have the ring and show experience. Finally, youth can explore different opportunities when it comes to leasing. Youth are always surprised to learn about all the classes that llamas are shown in and how much fun it can truly be! Oftentimes youth navigate what classes they enjoy best or which classes they dislike. Leasing also can be a chance for youth to realize that it is not what they want to do in 4-H or FFA without having the commitment of owning an animal.

The leasing program that my family and I had this year was extremely positive and rewarding for all involved. From our perspective, the llamas were able to get used to different handlers. Another benefit is the llamas are getting worked with while I am away from home attending college. The 4-H members who showed saw major success in the show ring and built an extremely great bond with the animals. As a family, we are more interested in what youth members learn and gain from experience than where they place at the county fair. One of the young ladies who leased from us made so much progress with our llama Charlie; it was really heart-warming to see the bond they formed by the end of the summer. My favorite part was seeing them in costume class because they both looked just so darn cute!

This upcoming year, more members are interested in leasing llamas from us, which would be great as it is my first year of not being in 4-H. I am looking forward to the chance to help grow youth involvement in the llama and alpaca hobby through the Adams County Camelid program.



Emma Cruckshank came up with a fun costume idea for her and Charlie as part of the Adams County Fair Llama/Alpaca show



Emilee Needham had the opportunity to lease a llama for the Adams County Fair and compete against Morgan Barba in the senior division



## Two Well-Deserved Retirements

Two long-time RMLA members have announced their retirements from their respective judging and committee work with ALSA. Congratulations and thank you to Karen Kinyon and Judy Glaser. These two outstanding RMLA members brought their knowledge of fiber to the forefront by educating people in our organization and nationally about the beauty of camelid fiber and took it to the highest level. We are thankful for the wisdom each so willingly have shared. Here is a bit of history on both members.



Karen Kinyon

In 1996 **Karen Kinyon** and Sharon Beacham approached RMLA about starting a Fiber Committee. Their motivation: to educate llama and alpaca owners about shearing for the health of their animals and then to teach what could be done with the shorn fiber. Shortly after that Karen, along with Sharon set up the RMLA Fiber Co-Op.

In 1997, Karen along with Sharon Beacham, Lucreda Hutchinson, Jenny Dieters and Susie Smithers served on the original committee to write llama fleece judging guidelines for ALSA. These five were the first ALSA Llama Fleece Judges. They taught the first certification llama fleece judging clinic at the first ALSA Grand Nationals, and more llama fleece judges were certified there.

In the summer of 2020, during the height of COVID, Colorado State University Veterinary Teaching Hospital was forced to cancel its annual shearing clinic. Immediately, Karen took steps to recruit the volunteers and shearers needed to ensure that the 50 animals signed up were shorn. RMLA sponsored the event to provide liability insurance and a comfort station.

Karen says “I have truly loved my 24 years of llama and alpaca fleece judging. It has been my pleasure to meet so many people and touch so many amazing camelids! Thank you to everyone who was part of this journey!” Karen will continue to teach fiber arts classes in her studio in Wellington, CO.

**Judy Glaser** became a Llama Fleece Judge in July of 2015.

She wanted to get exhibitors excited about llama fleece and all the wonderful items that could be created from it.

She became the Chair of the ALSA Fleece Committee in 2018. The Fleece Committee started reviewing the score cards and classes a few months later. The committee saw that the judges were now seeing a wide variety of items entered in the finished work classes that were not reflected in the current class listings. So the Fleece Committee went to work. As of today, the fleece class score cards are specific for the judges and explanatory for the exhibitors.

Judy says “my hand spun yarns, hand woven items and teaching weaving is starting to take center stage with my participation at The Twisted Shed Yarn and Fiber Store in Kiowa.”



Judy Glaser and Fleece Champion,  
Copperfield

## Ask the Vet: Importance of Monitoring Body Weight

By Caitlyn Mullins, DVM, MS,  
Livestock Medicine and Surgery Intern  
Colorado State University Teaching Hospital



### Why do we need to keep an eye on our animal's weight?

It is not hard to imagine that if body weight changes can be significant in humans and other animals, then weight changes in our llama and alpaca friends also deserve some attention. From birth through adulthood and into their older years, camelids may experience a wide variety of dietary, environmental, social, and medical stressors which can negatively impact their ability to maintain weight. Conversely, the thick fiber on many camelids can easily obscure weight gain or loss if one is not consistently body condition scoring or weighing their animals. Just as with other animals, there is a happy medium—a target ideal body weight range—where camelids will experience their best possible health.

### Monitoring weight and body condition

In general, newborn crias weigh anywhere from 8-30lbs, depending on species (alpaca vs llama) and size of the dam and sire. Adult llamas can reach 400 lbs. while the smaller adult alpacas can be as small as 100 lbs. while still being in good body condition.

The first step in using body weight to monitor growth and overall health is to invest in or find a weigh scale. This is most important when evaluating crias. Crias should be gaining weight at a fairly predictable rate but rarely show changes in body condition score. With an adequately lactating dam and vigorous nursing, a cria can double its body weight within the first month of life. A hanging scale (sometimes referred to as a fish scale) with a sling is an easy and efficient way to monitor cria weight even while being out in the field. Lack of consistent weight gain, or weight loss, throughout the first several months of life is cause for concern and should be investigated.

In contrast to crias, mature camelids do not experience further skeletal or bone growth and their body size is fixed. Thus, any extra weight loss or gain is likely to be visualized as excessive or loss of body fat cover over bony prominences. The body condition score, unlike body weight, is a subjective evaluation of overall body fat cover that can be applied to any animal at any life stage. There are a variety of body condition scoring systems available (commonly used ones include 5-point, 9-point, and 10-point scales). Regardless of what system you choose to use on your farm, the 'ideal' body condition will be near the middle of that range. Becoming familiar with one of these systems is invaluable, but note that it is imperative to physically touch your animals to assess body condition. The thick fiber on many camelids obscures boney landmarks and one's ability to see changes in body condition. Using body condition scoring to monitor juvenile and adult camelids can alert you to potential health problems or issues with diet.

### Common causes of weight loss

Weight loss can be due to a variety of factors. Therefore, a systematic evaluation by a veterinarian (physical examination in addition to other diagnostics) is often required to determine a root cause. In crias nursing on dams,



not only must the cria be healthy and vigorous enough to nurse, but the dam must also produce adequate milk to support growth. **A problem with inadequate cria weight gain may signal a problem with the dam.** Questions to think about when evaluating a cria that is not gaining weight or that is losing weight:

1. Is the cria able to find and latch on to a teat?
2. Can the cria produce a suckle sufficient to remove milk from the udder?
3. Is the dam healthy and willing to stand for the cria to nurse?
4. Is the dam's udder full with milk?
5. Does the cria have other signs of poor-doing (i.e., diarrhea, chronic bloat, lethargy, chronic cough, nasal discharge) that may point to a specific problem?

Unfortunately, some of the issues with cria weight gain may be due to congenital problems that can be anatomic or physiologic in nature. In many cases, however, these are non-correctable. Other common causes, which may or may not have other clinical signs besides weight loss, include things like genetic immunodeficiency syndromes and parasitism.

Problems with weight loss are more common in geriatric camelids. One common reason is difficulty obtaining high-quality feed that can be easily chewed and digested. Dental disease is also common in older animals and may limit an animal's ability to adequately chew long-stemmed feeds, such as hay, or break down small hard grains. In addition to being physically unable to chew well, dental diseases can also be quite painful and decrease an animal's desire to eat. Other issues especially common in aging camelids include arthritis, which limits ability to reach feed or graze over extensive pastures, and failing organ health.

More insidious infectious causes of weight loss are likely to necessitate further diagnostics and may or may not be treatable. Some of these issues include diseases such as Johne's disease, caseous lymphadenitis, Mycoplasmosis, and gastrointestinal parasitism. Unfortunately, cancer can also be a cause of weight loss, especially in older camelids. Finally, a camelid caretaker should carefully examine the living environment and social structures of adult camelids with weight loss. If there is inadequate feeding space or more food-aggressive camelids in the herd, it is possible that the animal at the lowest end of the social hierarchy may simply be receiving inadequate nutrition.

Due to the breadth of conditions that can cause weight loss, timely and thorough investigation by a veterinarian should be pursued.

### **Common causes of weight gain**

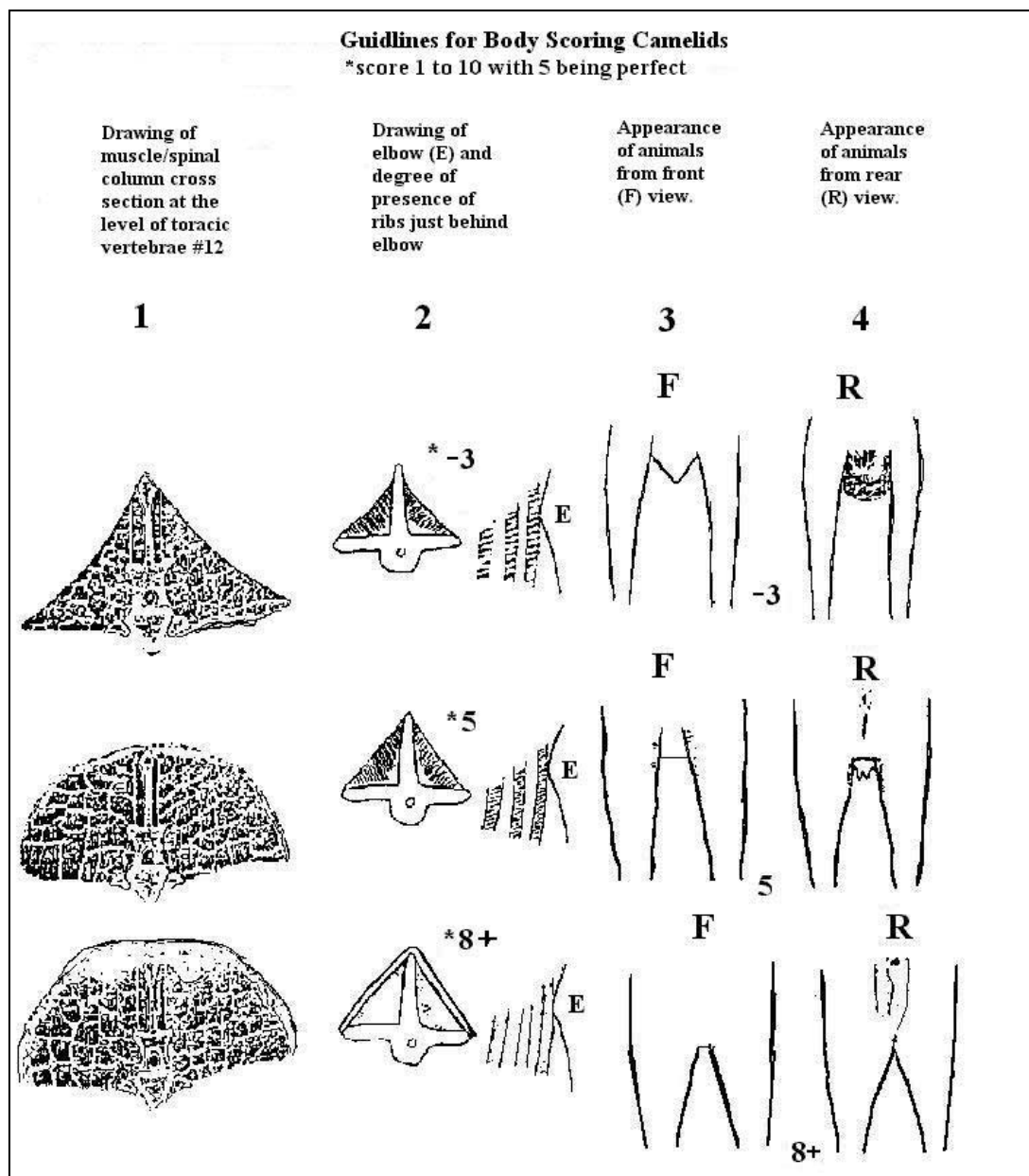
In contrast to the myriad conditions that can cause weight loss, weight gain is nearly always due to feed intake in excess of caloric requirements. A common belief is that camelids require grain in their diet to have balanced nutrition, but this is rarely the case. Providing a high-quality grass hay with supplemental minerals designed for camelids is sufficient for the vast majority of pet and sedentary camelids. Those that are lactating, gestating, breeding, growing (juveniles), or working (such as pack animals) will have greater dietary requirements and may benefit from grain or alfalfa hay supplementation. Not only does excess weight put undue strain on joints, it also predisposes camelids to potentially life-threatening conditions such as hepatic lipidosis and heat stroke. Even if your camelids receive only grass hay, it is important to regularly body condition score as excess intake of any feedstuff can contribute to weight gain.

### **Diagnostics**

A veterinarian may recommend one or several diagnostics to gain a broader understanding of underlying issues associated with a change in weight. These may include things like bloodwork, a fecal flotation, abdominal

ultrasound, and oral examination. Other, more specialized, tests can be performed in unique cases. Advanced imaging (e.g., CT scan, echocardiography, etc.) may be required to fully understand certain congenital anatomic abnormalities. If the problem appears to be seen in multiple animals, diet analysis in addition to possible infectious disease testing is warranted.

The bottom line is that regular weighing or body condition scoring of camelids is a critically important part of identifying problems in the early stages and helping your animals maintain optimal health. It can be done relatively quickly and easily and provides vital information. Your veterinarian will appreciate your diligence in noting weight loss or gain before it becomes severe. Whether managing one camelid or hundreds, the principles of weight management and monitoring are the same and should be an invaluable part of your camelid caretaking toolbox.





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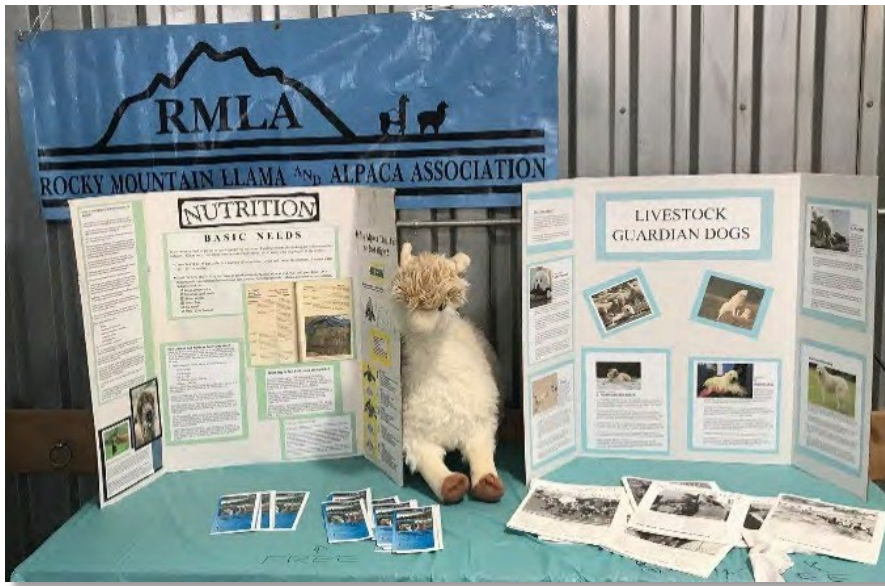
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## PacaBuddies 2021 Fall Event

By Ron Hinds  
el Zorro Colorado Alpacas



The PacaBuddies event in September 2021 was a terrific success. PacaBuddies is a group of local alpaca and llama folks in SE Metro Denver that get together twice a year at the Douglas County Fairgrounds in Castle Rock, CO. Over two days on September 11 & 12, 2021 the group of 8 farms & ranches sold over \$5000 of products. We set a record over the 2 days with over 200 visitors.

We don't spend a lot of advertising money. We do use local social media and free event websites, and we send out reminder postcards to 200-400 previous visitors, post flyers locally and hand out information postcards at other events. We have quite a

following of past visitors, even with the event not being held in September 2020 because of COVID. Cost to attend varies because Douglas County is always changing the rental fees for the facility but it has been reasonably inexpensive in the past. PacaBuddies has hosted this event for over 20 years at various facilities including Arapahoe County Fairgrounds and even local large barns. We have been at Douglas County Fairgrounds for the last 9 years.

PacaBuddies would like to invite other local folks to join us. Our next event will be the weekend before Valentine's Day, Feb. 12 & 13, 2022. Contact Ron Hinds at [alpacaron@gmail.com](mailto:alpacaron@gmail.com) for more information.





## Coconino Camelids

By Eric Souders  
4H Camelid Project

We are the Coconino Camelids, the 4H camelid project in Coconino County Arizona. Think Flagstaff, AZ. For over a decade we have been showing llamas at the county fair and in the last few years we have added a couple of camels and an alpaca.

Our monthly meetings focus on a task or education about camelid health, herding and handling, shearing, felting and spinning, and packing with the llamas or riding the camels. All of this is preparation for the showmanship, costume and obstacle competitions at the county fair.



Additionally, we participate in community events such as invasive weed collection and cleanup of local open spaces where the llamas pack out the collected weeds and trash. We are also a fixture at the Flagstaff Wool Festival where we educate the public about camelids and their fiber.

As the leader all these years, I have focused on the human connection to the animals which invariably leads to discussing and learning successful life skills and attitudes; clear communication, team work, patience, and not to take an animal's behavior personally. I provide all of the camelids, which allows any student to participate. This is a large animal project that does not require the purchase

or facility to keep a large animal at home. And since we work with the same camelids every year the kids get to know the animals throughout the years. Most of my animals have been to the fair and working with kids since they were born. This kind of experience has made them comfortable at the fair and very docile and tolerant with the kids.

The camels are a very exciting addition to the project as they are very different in personality, but similar in biology. Watching the relationships develop between the kids and the camels has been very rewarding. Their confidence grows and the pride that appears once the kids become comfortable with a very large and friendly camel does so much for their self-esteem. And then the thrill of riding the camel they've gotten to know!

The showmanship competition focuses on what the kids have learned, how they handle the animal in the ring and their ability to present themselves. Since we use the same animals every year, conformation is not considered. Everyone is a winner at the costume show. The creativity that the kids bring to this is often brilliant. The obstacle competition is as much about paying attention to the instructions as it is about working with the animal through the course.

Many of the kids return every year to further develop their relationships and skills with the camelids and each other. Often the older kids will become mentors and teachers of the younger kids as their maturity develops. I have even taken some of the senior students on pack trips in Colorado. It is a very experiential hands-on project where the kids get dirty, and occasionally spit on. As we like to say, “Spit happens and you’re nobody until you’ve been spit on by a camelid.”



## EDUCATION

### COVID-19 in Deer – Should We Be Concerned?

Ron Baird, Chair  
RMLA Research Committee

Easy to overlook in these tumultuous times are items not directly related to our day-to-day activities or concerns. One of these is the discovery that white-tailed deer have become a reservoir for the SARS-CoV-2 virus, popularly known as COVID-19.

They are present in most of southern Canada and all the United States mainland, except for parts of California, Arizona, Utah, Nevada, and Colorado. Their range covers the entirety of Mexico and Central America, reaching in South America as far south as Peru and Bolivia. The spread of coronavirus in white-tailed deer is of particular concern because of their abundant population, totaling about 30 million, and their proximity to humans.



The Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture began analyzing serum samples from free-range white-tailed deer for COVID-19 antibodies beginning early this year. Antibodies were detected in 33% of samples collected from deer populations in Illinois, Michigan, New York and Pennsylvania between January 2020 and March 2021. In another study, white-tailed deer sampled in various parts of Iowa between December 2020 and January 2021 tested positive for SARS-CoV-2. The percentage of SARS-CoV-2 positive deer increased throughout the study, with 33% of all deer testing positive.

The findings suggest white-tailed deer *may* be a reservoir for the COVID-19 virus to continually circulate and raises concerns for the emergence of new strains that may prove a threat to wildlife, domesticated animals, and humans.

Vivek Kapur (Huck Distinguished Chair in Global Health and professor of microbiology and infectious diseases at Pennsylvania State University), has said that while no evidence exists that the SARS-CoV-2 coronavirus is transmittable from deer to humans, hunters and those living near these deer may want to take precautions.

According to the Penn State study, “most viruses causing disease in humans originated in animals and many are capable of transmitting among multiple species,” and the reservoir host for SARS-CoV-2 is still unknown. Many animal species are susceptible to the virus and could act as reservoirs. “Our results suggest that deer have the potential to emerge as a major reservoir host for SARS-CoV-2, a finding that has important implications for the virus genomic diversity and future trajectory of the pandemic.”



White Tail Deer

In addition to the potential risk that deer infections could spill over into human populations, the researchers explained that viral mutation can occur in a reservoir host such as white-tailed deer, increasing the virus’ ability to cause disease. “Animal reservoirs are also rife with a plethora of other coronaviruses with which SARS-CoV-2 will be afforded the

opportunity to recombine, opening potential avenues for the acquisition of genes that might serve to increase virulence, transmissibility, pathogenicity, and immune evasion.”

The deer population is “highly susceptible” to COVID-19 infection and transmit it very efficiently to noninfected pen-mates”, Juergen Richt, director of the Center of Excellence for Emerging and Zoonotic Animal Diseases at Kansas State University, has said. “So not only do we know now that these companion animals, zoo animals, white-tailed deer, are highly susceptible to SARS-CoV-2, but also wild animals are now apparently seropositive and carry the virus,” he has said “there is now evidence that the virus, which transmitted very efficiently between humans, also can infect animals, and not only domestic animals but also animals in the wild.”



Mule Deer

Previous to these studies, the only species with lab results indicating they had contracted the virus in the wild had been mink. Cats, dogs, otters, lions, tigers, snow leopards, gorillas, and a cougar have all had outbreaks in captivity or in zoos. Recently, a hippopotamus tested positive for the virus. Coatimundi, indigenous to the American southwest, have also been found infected with the virus.

On December 11<sup>th</sup>, the Denver Zoo announced two hyenas had tested positive for SARS-CoV-2.



The problem that has emerged is clear: SARS-CoV-2 has a remarkable ability not only to mutate (as we now have the Omicron strain, the fifteenth letter in the Greek alphabet), but also to jump species. No reports of infections of mule deer yet have emerged, but they may in the future. Most lama owners live where one or both species of deer live, so care needs to be exercised. At present, I have seen or heard of no studies indicating cross-infection from white-tailed deer to llamas or alpacas. However, this aspect of the pandemic needs significantly more study and examination.

Is it a waste of owners' time to consider this could happen among their llamas and alpacas?

NO, we have experienced other instances of a disease or virus occurring or believed to have occurred, jumping species into llamas: Chronic Wasting Disease, Vesicular Stomatitis, and others that have affected the industry and slowed down its growth and expansion. These sorts of excuses have been employed repeatedly by owners of other species attempting to have llamas banned from national forests, parks, and other venues.

Hopefully, a veterinarian school will study the possibility of llamas being susceptible to SARS-CoV-2 (COVID-19) soon. Meanwhile, it is a definite reason to monitor your herd's health more closely than ever, especially if you live in an area where wildlife is prevalent.

## EDUCATION

### Ask the Vet: Bloat in Camelids

Catherine Krus, DVM  
CSU Veterinary Teaching Hospital

#### What causes bloat in camelids?

Bloat can be an alarming experience for animals and owners alike and can sometimes be life threatening. The diagnosis of bloat is a general term and can stem from numerous causes, the most common listed below. In its simplest definition, bloat is distention within the gastrointestinal tract, often due to gas. Colic is a term commonly used to describe discomfort associated with bloat and can manifest as kicking at the abdomen, laying down and getting up frequently, rolling, and an increase in heart and respiratory rate.

#### Common causes of Bloat (in order)

##### Adults

- Choke
- Overeating (legumes and grain)
- Bacterial overgrowth (Clostridial overgrowth)
- Coccidiosis (*Eimeria macusaniensis*)



## Crias

- Overfeeding
- Coccidiosis
- Bacterial overgrowth (Clostridial overgrowth)
- Mechanical obstruction (hairball, torsion, etc.)
- Umbilical hernia with strangulation

Like their personalities, camelid's gastrointestinal tracts are quite unique. They have a 3 chambered forestomach (C1, C2, C3) that leads into the small intestine and is followed by the large intestine. C1 is the first of these chambers and serves as a large mixing and fermenting vat, allowing for the breakdown of feedstuff into usable energy for the animal. C1 is the equivalent of the rumen and reticulum of our other livestock species and spans most of the left-hand side of the abdomen. Therefore, if you see distention on the left-hand side of your animal, it is likely due to C1 (or ruminal) bloat.

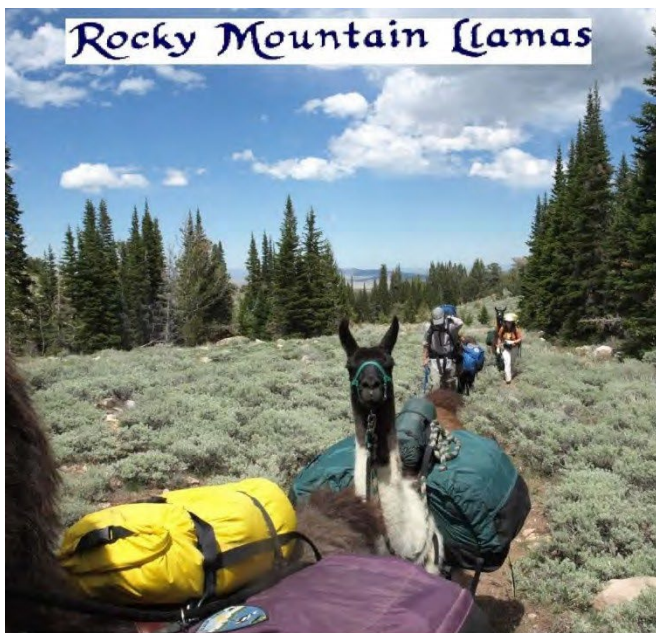
In our camelid species, C1 bloat is generally due to the failure to relieve gas from the rumen. One of the most common reasons for this is called choke, or when an animal has an obstruction in the esophagus, blocking the gas from escaping. This is frequently accompanied by froth and feed coming from the mouth as well as difficulty breathing.

An alternative explanation for C1 bloat includes an overproduction of gas within the chamber. This can happen with sudden changes in feedstuff as well as overindulging in feedstuff- especially highly fermentable carbohydrates or protein rich legumes, like grains and alfalfa respectively.

Obstructions within the gastrointestinal tract can likewise be a cause of abdominal distention. The area of the distention will be dependent on the duration, as well as the location of the obstruction. A disruption of outflow can occur from foreign objects, like hair or plastics, or due to biological processes, like tumors or strictures. Infectious processes can also mimic obstructions, the most common including bacterial overgrowth, often due to *Clostridium*, as well as intestinal parasites, frequently coccidia.

Of note, urinary obstruction in camelids, especially males, can cause abdominal distention and discomfort. This can easily be mistaken for bloat and gastrointestinal problems as they are often seen straining over a fecal pile.

As mentioned, bloat can be a stressful ordeal for both animal and owner. Due to the many causes of bloat, it is important to contact your veterinarian if you see evidence of abdominal distention in your animal. Information to have available when contacting your veterinarian include the duration of the problem, location of the distention, if the animal is still eating, drinking, urinating, and defecating normally, as well as any evidence of colic or respiratory distress. This will help you and your veterinarian work together as a team to gauge the severity of the problem as well as determine a plan moving forward.



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## Llamas and Birds

by Susi Hülsmeier-Sinay  
Yellowstone Llamas



It is a piercingly blue and cold morning. Not cold in the winter sense of the word, but certainly a promise of the advancing season. The trailer tires crunch on the skiff of snow that fell overnight as we roll towards today's adventure. Behind me, stowed in the trailer, are Lewis and three of his buddies as well as a few metal corral panels. We climb the pass that separates the Gallatin and Yellowstone valleys and drop into the canyon that eventually opens to the broad valley that the native inhabitants used to call the Valley of the Flowers. The sprawling town of Bozeman, Montana is lined by the Gallatin, Madison and Bridger mountain ranges, outlined sharply this morning against a clear sky. This is probably the last of a series of remarkably beautiful fall days this year.

Our adventure today is not going to be on a Yellowstone trail but a day in town, something we do not do often. Today, we will put on a fun llama event at an outdoor mall near one of the busiest roads dissecting the town. We will be tucked away from traffic in a parking lot surrounded by stores, and more importantly the store where I work part-time in the off-season: Wild Birds Unlimited.

This store caters to bird enthusiasts and hobbyists. Lewis and his crew will delight and entertain shoppers and visitors who will hopefully follow the announcement that the llamas are in town and increase the store's sales – as well as awareness about our favorite buddies, the llamas.

Some of you may remember Lewis the llama who had roamed Yellowstone National Park a few years ago for 3 months following an escape from a situation in the backcountry that involved a severe tooth ache and a halter that was put on too tight. I heard about the runaway llama who could not be caught and was subsequently abandoned. When I found him, he was quite willing and happy to follow me and three of my llamas out of the backcountry without a halter and settle into life with us after we took care of his teeth. We made a deal on that day of his rescue, a deal of trust and love, and have since formed a strong bond. Lewis and I have been back on the trails of Yellowstone many times. I know that he will follow me anywhere.

Today, on November 20th, we are here for a different type of adventure. Lewis plays the role of bringing holiday cheer. He is an entertainer, something that comes naturally to him. It always amazes me how these creatures without speech can draw and delight crowds of people. And Lewis does it best. He wears Christmas garb, red saddle bags with teddy bears and other presents peeking out, and a very stylish red scarf instead of a Santa hat. He made it clear that a hat is out! The plan is to attract shoppers to the store to do their Christmas shopping as well as enjoy the llamas and learn about them and our Yellowstone treks. Llama snacks are available inside the store. Good marketing!



Soon after setting up the corral holding Picasso, Ishi and Candido, people arrive and immediately come over to the llamas. Shoppers stream out of nearby stores and advance with broad smiles, others climb out of arriving cars crying excitedly, "Oh look! Llamas!!" Lewis bears his role with great dignity. He struts the pavement in front of the store



spreading holiday cheer among the people crowding around him while the other three regard the people hanging on the corral panels from a polite distance, munching on hay, occasionally advancing to take tasty morsels from their hands. Soon the store is hopping, people streaming inside to get the snacks that end up in eagerly outstretched hands. The llamas oblige. Lewis poses for photos. "I had no idea llamas are so well-behaved!" I hear that sentence a lot on that day.

Information tables are set up near the corral with leaflets containing information about llamas, their history and uses, about Lewis, about our trekking company. Two friends who arrive to help are busy answering eager questions. Everybody is smiling. The kids are fascinated, adults take photos for this year's Christmas cards. Many hands reach for Lewis' neck to touch his fleece. Even little babies in their mothers' arms eagerly extend their tiny hands towards him. He bears it all with patience and style, winking at me occasionally. He just loves to pose. The store is rocking. People return inside to shop. After a while, Lewis indicates he is tired. He takes a break in the corral and Candido, my older Argentine gentleman takes his place. Candido is mostly interested in the snacks but keeps an eye on the other llamas, just in case they take off without him. He is, however, briefly distracted by the colorful displays in the store's windows.

After 3 hours of loud humans around them, the llamas indicate that this adventure has come to an end. The store team is sad to see us go. Lewis peeks in the window posing his good-bye, then hops in the trailer with his buddies. He is clearly glad he exchanged his lonely wanderings in the wilds for a life with fun adventures. "You all did very well," I tell my llama team assembled in the trailer, and blow a kiss to Lewis. Soon we leave the Valley of the Flowers, rolling towards home over the pass.



And the birds? A small delegation of sparrows had watched the goings on from a high perch on a tree near the store, leaving the feeder near the entrance untouched for a change. But that's okay. One thing is for sure: the many shoppers will fill their bird feeders all over town tonight.

## EDUCATION

# Reconnecting with Friends and Re-Visiting Skills

By Kathy Stanko  
Whitewater, CO

After being scheduled and rescheduled numerous times, the 3-day Camelidynamics Clinic in Santa Fe, New Mexico finally happened. There were about 30 students, two instructors, 5 rescue llamas, and a herd of 60 or so alpacas.

RMLA was represented by, left to right, Lynda Liptak, L'illette Vasquez, myself and Robin Benton. Susan Unser had planned to attend but a family situation changed those plans. We had a great time catching up after many years.

I signed up for this clinic because I realized I had gotten sloppy with my skills and had actually forgotten how to perform some actions since I attended a clinic 4 or 5 years ago. And in fact, I learned that I was incorrectly doing some things like halter placement on the jaw line and using the wrong hand to move the wand. When I returned home and began the correct movements, I was amazed at how easy some of the basic handling became.



During the clinic, I experienced several “aha” moments when the light bulb goes click in a 100-watt flash. I want to share just one of these moments with you.

During the clinic, Marty has the participants wear a halter. The purpose of this exercise is to experience being led around by a human as well as to learn that lead ropes of different weights can make a difference. Just the weight of a lead rope creates a pull on the head. I asked my handler to really pull on me so I could experience what my llamas experience. In the photos on the next page I am being pulled forward (right photo) and pulled over (left photo) as I attempt to pull myself the opposite direction. I encourage you to try this; it will open your eyes to feel what your animals feel. And, try it with different weight lead ropes if you have them.

After returning home, I was very FULL of friends and information. For the first week, I sat in the pastures with my llamas and just ruminated on all that I had experienced...including the birth of two alpaca crias during the clinic.





## EDUCATION

### Don't Freeze Your Fecals!

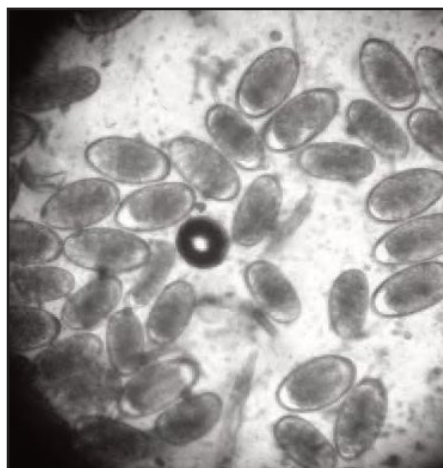
By Ann Bodnyk

Reprinted, with permission, from August 2021 GALA Newsletter

Don't freeze your fecals! Several times over the years I have been asked if it is OK to freeze fecal samples prior to sending for parasite analysis. I have always replied I didn't know but didn't it was think a good idea.

Recently I received a sample which was analyzed to have a very high load of Strongyle (455/gr). The owner had asked about freezing as she couldn't get to me right away, so the question was on my mind. There were then more beans sent than I needed, so as this was a statistically large sample I decided to try to answer the question. I froze the extra for a week, although I don't believe the length of time important.

The result: a 98 percent reduction in Strongyle eggs! WOW. I still had extra beans, so I did the analysis again in case I had made a procedure mistake. The second sample had 97 percent egg reduction. Note: this test was for Strongyles - it may not exactly extrapolate to other parasitespecies. So don't freeze the fecal samples! Refrigerate, but don't freeze.



Strongyles before and after freezing.



I would welcome comments/observations from vets or others doing your own fecal analyses.

### **Don't Freeze Your Fecals! Follow-up.**

by Ann Bodnyk

In the last issue of the GALA newsletter, I shared a small experiment I had done to evaluate the effect of freezing fecal samples before processing for parasite analysis. Freezing the fecal sample significantly compromised the viability of the parasite eggs, resulting in a 97-98% reduction in Strongyle eggs. So my advice was to keep the samples cool (refrigerate) but DON'T freeze. I invited any comments.

Anita Collins, longtime llama owner, GALA member and retired PhD scientist involved with cryopreserving honey bee semen in her research with the USDA, offered this helpful perspective:

Animal and plant cells contain a lot of water, which freezes into crystals. Those sharp crystals puncture cell walls easily. And the cell dies. So if you want to see whole cells, or eggs, or tissue, they have to be protected by a stabilizer, called a cryoprotectant. Cryo refers to freezing. For mammal semen that is often a chemical called DMSO, dimethyl sulfoxide, which causes the water to freeze in a different way that is smooth. So no punctures. Even so, you lose about 50% or more of the once live cells. Some animals make a natural cryoprotectant to protect themselves from winter cold. One I know of is reindeer, they produce this in their hooves. Amazing stuff, nature.

Anyone who has frozen hamburger (muscle tissue) has seen this effect. Once you thaw out the meat, it is much wetter due to the watery stuff from inside the cells. Did not surprise me that you had reductions of 97 and 98% in the eggs. These individual egg cells would have no protection whatsoever as they are more or less free in the fecal material once you process the sample.

Ann can be reached at [474ann@gmail.com](mailto:474ann@gmail.com) Anita at [frozenbeedoc@gmail.com](mailto:frozenbeedoc@gmail.com)

## **EDUCATION**

### **The Llama, the Hamster, and a New Path for COVID Treatment**

From Wired, 9/29/2021

Dr. Callan, DVM, alerted RMLA to the promising results of this research. An RMLA member then sent in this article about the research.

A set of papers shows that llama-derived antibodies protect the rodent against the virus—which bodes well for making a version for people.

For decades mice, monkeys, and roundworms have been the workhorses of science—“model organisms,” in academic parlance—and for good reason. After generations of research, scientists have a solid grasp on their genetics, physiology, and behavior, which makes it possible to study them in unparalleled detail. But some projects require something a bit more unique. To design a new potential COVID treatment, researchers at the Rosalind Franklin Institute at Oxford University took advantage of the biological quirks of an unlikely animal pair: the llama and the Syrian hamster.

Though llamas aren't exactly common tools for scientific research, their utility is well established: Like humans and other animals, they produce molecules called antibodies to recognize invaders and defeat infections, but their antibodies are unusually small. These "nanobodies" are far easier to manufacture in the lab than human antibodies, which makes them particularly useful for research and, potentially, clinical applications. "It seems to me that anything a human antibody can do, a nanobody could, in theory, do the same thing as well," says Jiandong Huo, a postdoctoral researcher at Oxford who led this study.



Llamas produce very small antibodies called "nanobodies" that are exceptionally good at blocking the virus that causes COVID-19 from infecting cells. PHOTOGRAPH: ALAMY

Last year, Huo and his colleagues published a paper showing that they had generated nanobodies that could neutralize SARS-CoV-2, the virus that causes COVID-19. These lab-made nanobodies blocked the virus from infecting cells in the test tube, but the team knew that the llama's immune system would do even better.

So they embarked on the far more time-consuming task of injecting a llama with the SARS-CoV-2 spike protein and waiting for it to generate its own novel nanobodies against the invader. Their patience was rewarded: These new nanobodies did a much better job of blocking the spike protein from attaching to the ACE2 receptor, the protein through which the virus accesses the cell. "They're about 1,000 times more potent," says James Naismith, professor of structural biology at Oxford University and a senior author on both studies.

Studying these nanobodies in the test tube wasn't enough to prove that they could successfully fight COVID, so Naismith and his colleagues moved from llamas to another animal with some convenient biology. Syrian, or golden, hamsters, which weigh about five times as much as the dwarf hamsters typically kept as pets, have also been used as research animals for a long time, but they are astonishingly well suited to the current moment—unlike most other small animals, they are susceptible to SARS-CoV-2. Through some strange biological happenstance, the hamster ACE2 receptor looks a lot like the human receptor. So when Huo and his colleagues obtained promising nanobodies from the llama, they were able to infect hamsters with the virus and see whether the nanobodies successfully fought it off.

The results, published last Wednesday in the journal *Nature Communications*, showed that hamsters who received a dose of one of those nanobodies 24 hours after being infected with SARS-CoV-2 returned to their pre-COVID weights just a few days later, a sign that they were beating the virus. Untreated control animals continued to lose weight. The treated hamsters also showed significantly less evidence of lung infection. And because nanobodies are so small and so stable, the researchers didn't even have to inject the treatment, as is necessary for a human-derived antibody—the nanobodies were sprayed directly into the hamsters' nostrils.

The 24-hour delay between infection and nasal spray has important implications for the potential use of this nanobody as a COVID treatment, says Ray Owens, professor of molecular biology at Oxford and the studies' other



senior author. Once SARS-CoV-2 has entered the animal's cells and started producing more copies of itself, the nanobodies have a much harder job to do in treating the disease. "The fact that you can dampen that down and take it out of the system ... it gives you a strong indication of the potential for these sorts of agents as therapeutics," says Owens.

The Oxford team originally identified four different llama nanobodies as promising candidates, but they only tested one in hamsters: C5, which blew last year's options out of the water. "It's amongst the best in the field," says Phillip Pymm, a postdoctoral researcher at the Walter and Eliza Hall Institute of Medical Research who was not involved in this study.

The Oxford researchers aren't certain why C5 works so well, but they do have a theory. Unlike many other nanobodies, C5 binds to the "all down" configuration of the SARS-CoV-2 spike protein, which is unable to infect cells, and keeps it from moving into an infectious configuration. By essentially locking spike proteins into this inactive state, C5 may provide a particularly high degree of protection. "The C5's absolutely a stone-dead killer of the virus," Naismith says. (To make the nanobodies as potent as possible, they used a "trimer"—three copies of it bound together.) And, he says, he and his team have forthcoming work demonstrating that C5 is just as effective against the Delta variant.

Back in May, a team from the University of Pittsburgh demonstrated that their own llama-derived nanobody could also prevent and treat COVID in hamsters when administered through a nasal spray. Like the treated hamsters in the Oxford study, these animals lost minimal weight after infection and had much less virus in their lungs than their untreated counterparts.

For Paul Duprex, a professor of microbiology and molecular genetics at the University of Pittsburgh and one of the senior authors on that study, expanding the menu of nanobodies that could treat COVID represents an important advance. "What we're really excited about is the use of combinations of different antibodies as a mechanism of overcoming variants," he says. Imagine a variety of nanobodies administered as a cocktail; if a viral mutation prevents one nanobody from binding, others might be able to compensate.

But despite their unusual biological resemblance to us in one aspect, hamsters are far from human. They are much smaller, for one thing, and COVID progresses in them more quickly. C5 and the other nanobodies still have a long way to go before they can be used to treat people—there's no guarantee that what works in hamsters will prove successful in humans. "The proof of the pudding is in the eating," Duprex says. "Let's see where it goes." And we won't know immediately; the human clinical trial process is rigorous and takes time.

Nevertheless, the successful hamster experiments represent a major step forward from the Oxford team's llama nanobody work last summer. They are already tentatively excited about what nanobodies could mean for the treatment of respiratory illnesses. Since they can be administered intranasally, a person who tests positive for COVID could—in theory—quickly and easily take a treatment at home. Naismith imagines that someone about to enter a high-risk environment, like a nursing home or hospital, could protect themselves from infection by taking a preventative dose. And sprays have another important advantage—they go directly into the airway. "It actually targets the site of infection in respiratory diseases like COVID," Pymm says. With nanobodies protecting the throat and lungs, COVID might never be able to gain a hold in someone's body.

While producing llama nanobodies is slow when the llamas do it, they can be synthesized cheaply and easily in yeast and bacteria—and they don't require sophisticated storage like human antibodies do. "Nanobodies are more robust, and they can be kept even at warm temperatures," Huo says, which means that they could perhaps be more easily distributed to low-income regions, where refrigeration may be an issue.

The Oxford team hopes to start moving through human clinical trials soon, but they also hope that, by the time any treatment might be approved, vaccines and other measures will have already ended the pandemic. Even if these nanobodies are never used to treat COVID, Naismith says that what they've learned will still be valuable. "We'll get through the clinical trials and get that accumulated knowledge, so that when the next thing comes—the next respiratory disease—then we know the road map," he says.

During future pandemics, lab-generated nanobodies could potentially work as a stopgap measure until vaccines can be rolled out. "We can't go much faster on vaccines than we went—they're always going to be a few months," Naismith says. "Nanobodies could be faster than vaccines, at least in that early stage."

## FIBER

### Save Our Stash

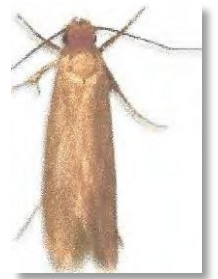
#### Protect your precious fibers and yarns

By Leslie Ordal

Originally published in Spin-Off, Spring 2015

It's a scenario we all fear: opening up your stash to discover tiny holes in your handspun yarn or garments, or startling a winged insect that was happily relaxing in your prize Merino. While many of us shudder at the thought, there are steps you can take to protect your stash or deal with an infestation of pests that snack on fiber.

The main insect threats to fiber are the clothes moth and the carpet beetle. The clothes moth is actually two species, the webbing moth and the case-making moth. Both are a light brown or beige color and grow to about ¼ inch long as adults. They're named after what their larvae leave behind after eating a meal of fiber or fabric—either patches of silken webbing or dry, case-like cocoons. There are a few species of carpet beetle, which vary in color and size depending on where they are in their life cycle, but all are small, round bugs with short antennae as adults. Larvae may be furry or smooth and sometimes leave behind shed skins or waste pellets that look like grains of salt.



Adult Clothes  
Moth

Both clothes moths and carpet beetles feed on the proteins in animal fibers such as wool and silk, but they may also chew through cotton or synthetic fibers to get to a good source of animal fiber. Cotton and other cellulose-based fibers such as hemp, linen, and rayon usually aren't at risk, other than as collateral damage as bugs seek out wool or another animal fiber. Moths and carpet beetles can't break down cellulose so it's a poor food source for them. Lisa Stockebrand, conservation technician at the Philadelphia Museum of Art, says that moths and carpet beetles can be attracted by other substances that may be on the fiber itself, such as sweat, skin flakes, or food stains. In this case, they will munch on whatever fiber they find, so it's a good idea to carefully launder or dry-clean items if they become soiled.

Our parents and grandparents often relied on naphthalene or paradichlorobenzene based moth repellents (i.e., mothballs or moth crystals) to protect their clothing while in storage, usually in a warm attic over the summer months. Dark, warm, and undisturbed is the perfect environment for fabric pests to thrive, but modern practices of storing clothing in regularly opened closets year-round has lessened the threat of these pests. Mothballs are effective if used properly, in airtight containers where their fumes can become concentrated enough to kill any unwanted bugs, but concerns about toxicity and their unpleasant smell make them unpopular among most fiber artists. In general, it's a good idea to frequently expose your animal



fibers, whether in fabric or fleece form, to light, air, and movement. Disturbing moths can make them stop feeding long enough to starve to death, so bringing your stash (and clothing) out into the light every once in a while is another preventative measure.

The most effective protection against moths and carpet beetles, however, is airtight containers. If they can't get in, they won't be able to do any harm, says Phil Nixon, PhD, extension entomologist at the University of Illinois. He advocates the use of sealed plastic bags or other airtight containers as the primary way to protect against fabric pests. Although moths and carpet beetles can chew through plastic bags, they have no motivation to do so if they can't detect the fiber inside. This is why airtight seals are key-with no way to smell what's inside, pests will leave the bags alone.

Many spinners have raw or unwashed fiber in their stashes, and the question is often asked, is it best to wash fiber before storing it, or keep it in its raw form. Nixon explains that fabric pests can't survive on clean fiber alone-they need the extra proteins and fats on dirty or soiled fiber to get all the nutrition they need. This would seem to indicate that scouring before storage is the way to go, but Nixon reiterates that the key to pest-proofing your stash is the use of airtight containers. Whether dirty or clean, fiber in a sealed, airtight plastic bag or other container is going to be inaccessible to any hungry moths or beetles. Just make sure it's actually tightly sealed: "If you can smell your cedar chest when you walk by it, it's not doing you any good," says Nixon. Stockebrand confirms that lanolin is a premium foodsource for hungry fabric pests, but if they can't get to it, they can't eat it or the wool it's on. She advises checking plastic storage tubs and bins before you buy to make sure they are truly airtight, as many storage containers do not have good seals.

With respect to cedar chests, there are a number of herbal methods frequently shared to help fight the threat of fabric and fiber pests, but do they work? The truth is that substances such as cedar can repel and even kill pests, but the volatile oils produced by the cedar or herbs need to be at an extremely high concentration to work. A newly made cedar chest or fresh cedar shavings in a sealed plastic bag may help, but throwing a few cedar balls into your stash isn't going to make any difference.

Sachets of herbs such as lavender and peppermint are popular as an alternative to the traditional mothballs or crystals, but it's not clear that they work, and little is known about how safe they are when concentrated enough to kill moths. "Essential oils concentrate the toxicity of a particular plant," says Nixon. "And what's toxic to moths may be toxic to people and pets." He also warns about home remedies such as storing hedge apples (the fruit of the Osage orange plant) in your attic or closet, as hedge apples may have carcinogenic properties. Stockebrand does not recommend using herbal repellents and has even spotted moths happily living on herbal insect-repelling sachets!



An herbal sachet chewed by moths-and the ruined yarn it was supposed to protect.

What happens if you see a moth in your stash? First, don't worry too much. Clothes moth populations have plummeted since the invention of dry cleaning in 1911-most damage to fabric is actually done by carpet beetles. With thousands of moth species in existence, it's unlikely that any moths you come across in your home are after your fiber. The food and grain eating Indian meal moth, also known as the pantry moth, is a common pest in the home and happens to look a lot like the clothes moth, although it's about twice as large. It's also a misconception that adult moths do the damage; it's actually their larvae that need protein fiber to

grow. If you see no larvae, casings, or signs of silkwebbing-and no damage done to your stash- you're probably okay.

If you do find signs of an infestation or damage or if you just want to be extra careful-there are steps you can take. Three days in the freezer is the method Nixon recommends for most small infestations. This is enough time to kill off any fiber-eating pests, whether moth or carpet beetle, but there are a couple of caveats to the freezer method. Stockebrand notes that frost-free freezers periodically cycle above the freezing point, which means they don't maintain the consistently low temperature needed to kill bugs. She recommends using a chest freezer without the frost free feature.

Nixon points out that clothes moths also have evolved a mechanism that protects them against cold under certain conditions. Given adequate time to adjust to falling temperatures, clothes moths will produce glycol (the main component of antifreeze) and other freeze-resistant-substances in their bodies, protecting them from otherwise lethally cold environments. The key to this process is time: moths exposed to gradually cooler weather from fall to winter will be protected from the cold, but they can't cope with a sudden sharp drop in temperature. So if in the middle of winter you find moths in a fleece that has been stored in an unheated garage, the freezer method may not be of any help.

Any items that have been kept at room temperature, however, can be de-mothified by that three-day trip to the freezer. Extreme heat will also kill fabric pests. Clothes moths and carpet beetles can be killed by 30 minutes at 130 degrees Fahrenheit, so careful heating in a kitchen oven can also do the trick. Just be sure not to overheat the fiber or let it touch the heating elements. Also keep in mind that synthetic fibers tend to have a much lower melting point than animal fibers, so the heat method may not be the best option for synthetic blends, says Nixon. Stockebrand also suggests a warm-water wash, as long as the temperature of the water stays at 120 degrees or above for 20 to 30 minutes.

Protecting your stash from moths and carpet beetles isn't difficult, though it does require some effort. In addition to airtight containers, Stockebrand advises good housekeeping as the best prevention. "Consider the dust bunny a 24/7 bed-and-breakfast with an all-you-can-eat buffet," she says. Removing potential food sources and hideouts in the environment will make your house less attractive to pests. Even after an infestation, careful attention to wiping down baseboards and vacuuming under drawers will reduce the chance that any eggs that may have escaped will be able to grow up into hungry, fiber-eating larvae.

For more information about clothes moths and carpet beetles, and how to deal with them, visit the websites listed below, or contact your local agricultural extension service.

**Leslie Ordal** writes and works in health care research in Toronto, Ontario, Canada. Her blog can be found at [www.leslieordal.com](http://www.leslieordal.com).

## RESOURCES

- Cornell University Insect Diagnostic Laboratory Factsheets: <http://idl.entomology.cornell.edu/factsheets>
- University of California Integrated Pest Management Program: [www.ipm.ucdavis.edu/PMG/menu.homegarden](http://www.ipm.ucdavis.edu/PMG/menu.homegarden)
- Clemson University Household and Structural Insect Factsheets: [www.clemson.edu/cafls/departments/esps/factsheets/household\\_structural/index.html](http://www.clemson.edu/cafls/departments/esps/factsheets/household_structural/index.html)



## Meet the Beauty Queens of Al Dhafra

Camel beauty contests take center stage at a celebration of Bedouin culture, held annually in the United Arab Emirates.

*Photographs and Text by Kiki Streitberger*

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“Camel No. 1! Camel No. 1!”

I had just arrived at the Al Dhafra Festival, and young boys in kanduras, or long tunics, were running toward my car, shouting as they pointed their index fingers in the air. In the distance, two men rode camels, each pulling another of the animals on a leash. One of the camels was draped in a gold-tasseled winner’s blanket.

Behind the men, slowly making its way across the sand dunes, was a large convoy of honking pickup trucks. Men and boys stood in the beds of the vehicles and leaned out of all the windows, waving and cheering, many of them filming the scene on their phones. Without a second

thought, I left my little rental car behind — I wouldn’t have gotten far in the deep sand, anyway — and jumped on the back of the nearest pickup. I wanted to be part of this impromptu celebration.

The annual Al Dhafra Festival celebrates Bedouin traditions, and takes place at the edge of the Rub al Khali, or the Empty Quarter, considered the largest sand desert in the world, near the Emirati city of Madinat Zayed, a two-hour drive southwest of Abu Dhabi. Highlights of the gathering include Saluki races (the dogs are prized by the Bedouin because of their speed and eyesight), poetry readings and exhibitions on falconry and traditional artisanship. From fresh dates to camel milk, there’s also an array of food and drink.

At the heart of the festival, however, are the camel beauty contests. During the weeklong event, Al Dhafra is the epicenter of the camel universe. In 2019, the year I attended, more than 24,000 camels from all over the Middle East competed for 60 million Emirati dirham in prize money — the equivalent of more than \$16 million. Vast sums of money also change hands as particularly beautiful camels are sold.





Some participants trace the origins of the beauty contests to a family dispute in 1993, when two camel breeders had to call on some independent judges to determine whose animals were more beautiful. Since then, camel beauty contests have evolved into a multimillion-dollar industry, with state-sponsored heritage festivals held all across the country.

The aims of the Al Dhafra Festival, which was formally initiated by the government in 2008, are to celebrate Bedouin culture, generate tourism and preserve the purity of certain camel breeds. Bedouin society has all but vanished in the last fifty years. Modern borders have stifled nomadic

herding patterns, and the encroachment of economic and technological change has upended other traditional cultural practices. For urbanized Bedouins, festivals like Al Dhafra are one of the few ways they can meaningfully sustain their traditions.

Camel beauty competitions are divided into different categories, according to breed, age, sex and whether a camel is owned by a sheikh or a tribesman. The criteria, however, remain the same. The ideal camel has long straight legs, a long neck, a shapely hump (in just the right spot on its lower back), pert ears, expressive eyes framed by upward curled eyelashes, long droopy lips and, of course, a sleek coat and elegant posture.

No supermodel is complete without jewelry, and an entire industry has sprung up around the beauty pageants to provide the appropriate accouterments. Camel tailors, for example, set up camp at Al Dhafra, where they sell colorful reins, shiny

camel blankets laced with tinsel tassels and even glittering necklaces made of plastic beads and stringed coins.



Million Street, the road along which the camel superstars strut, transforms into an open-air market of tents, caravans and food trucks. The market isn't simply a place to purchase camel tack and shampoo. Also on offer are colorful winter blankets, coffee serving sets, stoves, rugs, hunting gear, foldable chairs, waterskins and an



assortment of clothing. Bright lights advertise restaurants that serve kebabs, cakes and sweet karak chai. There are even laundry services to keep the celebrants — both the people and the camels — looking pristine.

Emirati women play a limited role during the festival. Customarily excluded from participating in the camel competitions, women and children spend much of their time around their family tents or at a nearby market. As a foreigner, however, I seemed to be exempt from the gender restrictions and, during my three-day visit, was able to walk around freely, attend the camel beauty contests and join the owners at the winners' celebrations.



As the sun set and the sky turned a dusky purple, canopies adorned with thousands of lights began to sparkle among the dunes. Inside were members of the Bedouin tribes, usually scattered all over the region, who had come here to honor their traditions. Each tribe had set up a lavishly decorated tent.



Invited to celebrate one of their camels' wins, I joined the men of the Almuhammami family into their illuminated tent, following Waheela, a beauty queen. "She has just been crowned the most beautiful young camel in the Middle East," said Muneef, her 12-year-old owner, beaming with pride. And then the music began, and the men lifted their bamboo canes to perform the yowlah. During the traditional stick dance, men chanted poetry and simulated a battle scene. By the time I left the party, the sky had turned inky black, with the revelry lasting deep into the night.

**Kiki Streitberger** is a photojournalist and documentary photographer based in London and Germany. You may reach her at

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*Happy New Year.  
Let's have some fun!*



New York City, 1957