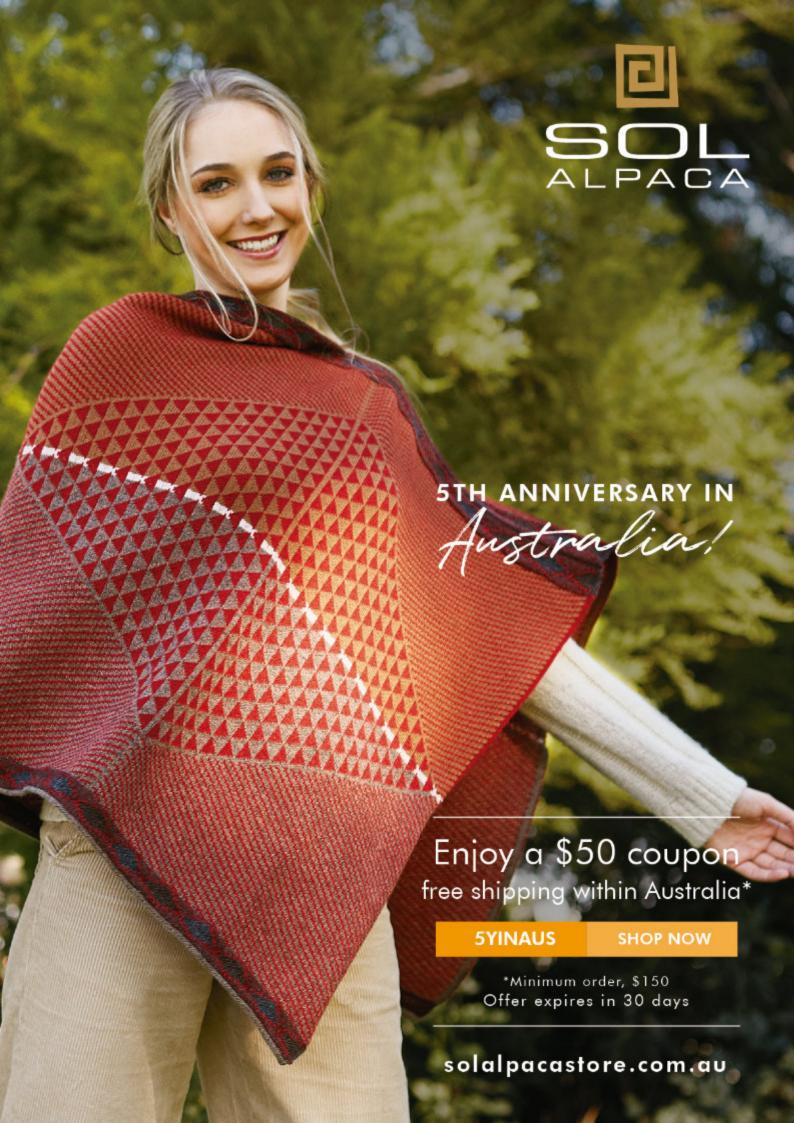


Camelid Connections

MAGAZINE







Publisher

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Cover: NSW fires courtesy of J. Button Tandara Hilltop Farm

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Welcome to Camelid Connections

For many camelid owners it has been a difficult time with drought for months or years, then to end the year many of us experienced an awful fire season and some also had floods. We hope the Autumn season brings everyone the start of a much less dramatic time ahead.

In this issue we cover a wide variety of topics but now the grass is growing in many places again after a long spell of dry feeding you may find the article on Pulpy Kidney on page 20 timely, as it is a disease associated with a dramatic changes in feed like you may be experiencing now.

An interesting article on page 6 about alpaca clothing made by prison inmates in Peru and Thailand gives us a view into another world, and how one company is trying to run a business with imates as it's employees.

Some ideas for how to entertain young visitors to your farm with crafts can be found on page 13, a handy reference for visits from local school children or open days associated with alpaca week or other events.

The fires left many of us with stories to tell about these trying times and I highlight just a few of those in my article on page 16, where I give my perspective of what it was like living with a 'campaign fire' for 6 weeks and how other alpaca breeders in my area were impacted and some of their stories of survival.

In this issue we also bring you articles about making fertiliser for your garden and paddocks from your camelid dung, the story of a young cria's broken leg and more.

As usual, please try to support our advertisers whenever possible as they make this magazine free for our readers and without them there would be no magazine.

If you have an interesting and informative article you think could be of interest to our readers we are always happy to consider submissions.

Meet The Team



Esme Graham - Editor

My husband and I have bred suri alpacas for over 20 years, I was heavily involved with both regional committees and the national board of the Australian Alpaca Association for a number of years and had the honour of being selected as a life member of the Association.

My major interest has been in marketing and education and to this end I was editor of Alpacas Australia magazine for six years and I hope that the experience I gained editing that publication can be extended to educate and inform a wider range of alpaca and Ilama breeders who are not necessarily association members but have a love of all things camelid.



Julie McClen - Designer/Editor

A breeder of ultrafine Huacaya alpacas for over 19 years, I have a passion for fine fibre and the genetic connection to the most diminutive and finest of the camelids - the wild Vicuna.

I strongly believe that education in any industry is the key to success, so with Camelid Connections we hope to provide interesting and informative articles to assist all camelid owners in getting the most out of their animals and businesses.

I also own Oak Grove Graphics a web and graphic design agency which is producing this magazine, and also allows me to connect with many different people in the camelid related world through my design and web work.

www.oakgrovegraphics.com.au



Is it possible to build a profitable fashion business behind bars?

Carcel is a Danish clothing company with a vision to accelerate and inspire the worlds transition to a desirable, sustainable fashion industry. Their mission is to create a global desirable fashion alternative that eradicates poverty for women in prison and protects our planet through aspiration, design and technology.

How did it all start?

Founder, Veronica D'Souza, came up with the idea after visiting a women's prison in Nairobi. The women told her that the main reason for their imprisonment was poverty. Most of them were there for committing non-violent crimes because they wanted to provide for their children. At the same time, they were making small crafts like knitting sweaters and teddy-bears. Without access to good materials, skills-training or a market on the outside, they didn't get to sell their products. When they left prison they were further marginalized and impoverished and many of their children had been left to grow up without a provider, continuing the poverty cycle.

Veronica started researching and discovered that this is the case for women in prison all over the world. Very few organisations talk about this issue, and there is generally very little awareness around this topic. Veronica decided to create a company that would constructively put to use the time spent in prison, rendering it as an opportunity to gain new skills and fair wages so that incarcerated women could provide for themselves, for their families and save up for when they were released. Veronica paired up with designer Louise Van Hauen, and together they started the first production facility inside the women's prison in Cusco, Peru.

How we work in prisons

Setting up our own production facilities within prisons and managing these ourselves enables us to make sure that the labour rights and wages are matched to best practices within production sites outside of prisons. We have appointed our own production managers in our two production facilities, in Cusco, Peru, and Chiang Mai, Thailand. They are on site every day, managing everything from recruitment, training, working hours and payment to ensure that our standards are maintained and developed. Our Copenhagen based team also visits on a regular basis. We see our work spaces in Thailand and Peru as an extension of our company in Denmark, and we treat everyone as our employees.

Most of the design process takes place together with our teams inside the prison. It's important to us that everyone learns all the different techniques from stitching to pattern making. Our teams are exceptionally talented and committed and function more and more as the design development studio.

We also have courses in other areas of expertise in order to develop new skills that are useful for life after prison. So far, we have carried out courses in entrepreneurship, financial literacy, English, jewellery making and business plan development.

CARCEL

Cusco, Peru

In Peru, we have created the NGO 'Association Made in Prison Peru' in which every woman is employed. The day to day responsibility lies with our production manager Surya Miranda. She is on site every day with our team and carries out training and development, ensures quality control and manages payments.

We currently have 15 women on our team, some of whom have been working with us for more than two years. The working hours are 5 hours per day, five days per week. As there is no internet or cell phones in prison, we communicate through Surya, who oversees the dialog between our production team and our headquarters on a daily basis.

Chiang Mai Women's correctional Institution, Thailand.

In Thailand, we have a partnership with the Ministry of Justice, The Department of Corrections, Chiang Mai Women's Correctional Institution and the NGO 'Kamlanjai Project' under HRH Princess Bajrakitiyabha Mahidol, who is UNODC Goodwill ambassador for South East Asia.

This partnership allows us to pioneer a new model for employment inside of the prison.

What we mean by fair wages

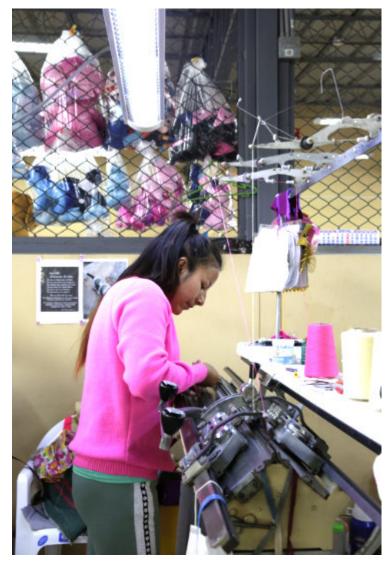
What do we mean by fair wage?

We adhere to the recommendation by the International Labour Organisation (ILO) that everyone should make a living wage, which is the amount of income that is needed to cover the cost of living in a given country. No matter where you are situated geographically or what it is that you do, you should be entitled to a wage that enables you to have a decent standard of living.

A fair wage is determined by country, to reflect local market conditions and regulations. We benchmark against similar jobs on the market, look at recommendations by trusted organisations and speak with our employees about it.

Defining a living wage is complicated, as the methodology is based on the actual cost of living for a single person or a family in a given geographical area. This varies widely whether you live in the countryside or the city, and depending on the size of the family or co-dependencies you have.

The costs of living in a prison are different than on the outside. However, most of our employees have families to provide for and we therefore benchmark with a living wage that covers the support of families outside of prison. We monitor the local conditions and should any general changes be applied to the labour markets within the countries in



which we operate, we are ready to adjust our employees' wages accordingly.

At Carcel, we engage with our employees directly to get their feedback, as well as with international experts from organisations such as the ILO and the UN in order to ensure that we comply and go beyond The Convention Against Forced Labour and The United Nations Standard Minimum Rules for the Treatment of Prisoners.

Transparency

The entire fashion industry needs transparency. We need to talk much more about who makes our clothes, how wages are set, what the costs are and what the profits are spent on.

We are a social business because we believe in improving lives for women in prison through a sustainable business model. Everything we make we invest back into the company. We make sure that our employees get fair wages, and invest in the production equipment and machinery, training, high quality materials, and natural materials in timeless designs that last.

Our prices reflect an equal investment in social impact, production costs and business development.

Our pricing strategy

We build our prices from the bottom up. This means that we start with the cost of a fair wage, then we add the cost of quality materials, and all other costs related to that product. That is our true cost.

Materials; is the costs of the yarn, fabric, thread, dying and print from our regional suppliers.

Labour; is the salary of the working hours from the beginning to the end of a product.

Operations; is maintenance of our machinery, quality check, local documents and labour of our production manager.

Bio packing; is hangtags, neck- and care label and biodegradable packing.

Freight; is CO2 compensated freight from Peru and Thailand to Denmark.



Our mark-up

We sell both through selected stores and online. This means that both our mark-up and our cost vary depending on the sales channel. It is however important, that the price of a product costs the same no matter whether you find it in a store or online. And to us, it is important that it never goes on sale and never loses its value, no matter what month it is.

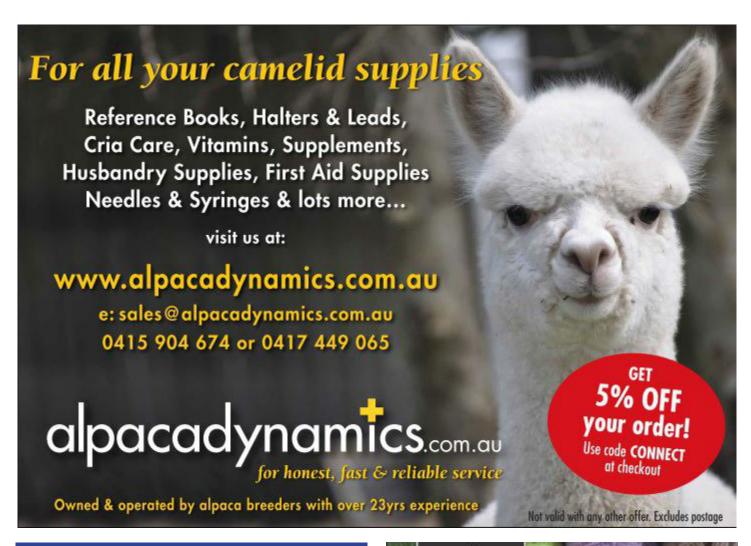
*When we are selling online, the costs are higher due to online payment fees, packaging and shipping to customer. Cutting out retail, our mark-up is higher. Working within the prison system is complex, but we believe that creating new and fair standards for work as rehabilitation can have a tremendous impact for incarcerated women.



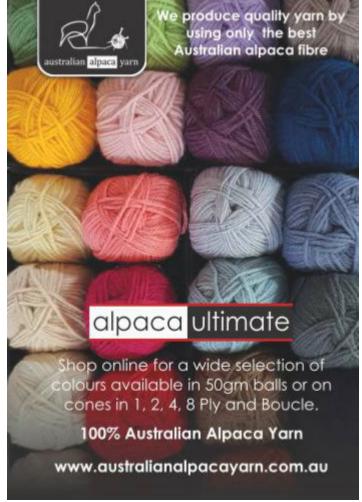














generate a very close, intimate and, eventually, permanent connexion.

Located in the city of Cuzco, the famous historic capital of Peru, the Sol Vicuña Boutique Museum is a milestone in Peruvian culture as Sol Alpaca is the world's first brand to encapsulate the textile tradition of an entire country within an inspiring and sophisticated space. This unique museum is specially designed to offer an unforgettable experience to visitors, both local and foreign, who wish to enjoy an enriching encounter with a textile tradition over 5000 years old.

Luxury is based on experiences. Sol Vicuña offers an educational trip from the beginnings of history up to our present day by means of complete and detailed information that explains the evolution of the vicuña, the ancient Andean ritual of shearing - the Chaccu - the uses and exploitation of the fibre, the sustaina- bility of the species and other interesting historical facts.

The unique experience offered by Sol Vicuña is achieved and complemented by its alliance with the Amano Museum - the first museum of Pre-Columbian textiles in Peru - in a space where time goes by unnoticed while a close-up view is given of an invaluable collection of historic items; they attest to the Wari culture's relationship with the vicuña and how its fibre was used before the arrival of the Spanish conquerors.

Sol Vicuña also offers beautiful accessories made from 100% vicuña, the world's finest and most exclusive fibre. These fine articles possess not only elegance, warmth, exceptional softness, beautiful drape and a magical, unique lustre but also characteristics linked to Nature, culture, technology and creative work.

Backing of the Michell Group

The Peruvian firm Michell & Compañía is the world's largest alpaca textile business, being vertically integrated from the raising of alpacas to the selling of products to final consumers.

Michell & Compañía is proud to contribute to the rescue of the paradigmatic vicuña. Not only do we believe in its beauty but we also share a love for its history, promoting its breeding in a way that protects and respects Nature. The effort, commitment and devotion addressed to the protection of this lovely animal, together with all the people that surround its textile history, are translated, presented and celebrated through Sol Vicuña, enabling the vicuña fibre, the world's finest, to be shared once more with the entire human race.

The real treasure of the Andes

Wild, delicate and elegant; delightfully free, and native to the Peruvian Andes.

Facing the sun while feeding on its mother's milk, the vicuña presides over the highlands; indeed, it could even be said that its domains include the clouds and the limitless skies because it inhabits the high, starry regions at more than 5000 metres above sea level.





The golden fleece

Vicuñas have a beautiful golden coat, thick and soft, which enables them to keep warm in the cold highland climate. Healthful proteins such as keratin make up the main part of their wonderful fibre, a gift from Nature and unsurpassed in quality and texture; it is superior even to the fibres produced by the Kashmir goat in the Himalayas.

The Peruvian Inca Empire was the most sophisticated political organization within the pre-Columbian universe and, in large measure, the camelids were the basis for the development of this imperial people. Camelids were used as beasts of burden, as a source of meat, and as providers of fibre for making warm clothes. Among them, the vicuña was considered a sacred animal by this society which respected, above all, Mother Earth. The animals were shorn without suffering any harm in a procedure known as the Chaccu, a ceremony full of mysticism, offerings and happiness with moments of true religious gratitude when the fibre of the gods was collected.



Rescue of the Vicuña

Although several laws had been made to protect the vicuña during the Republican era of Peru, indiscriminate poaching increased steadily so that, by 1960, it was estimated that only 5000 vicuñas remained in Peru;

A shameful extinction event seemed imminent.

Thanks to the perseverance of some distinguished Peruvians, National Reserves in Ayacucho and Arequipa were established in the latter part of the 1960s. Even so, the rescue of the vicuña turned out to be no easy task and a coordinated international effort was required in order to accomplish it.

This is how, during the 1970s, the basis of formal worldwide protection for the animal was established through the Vicuña Convention signed by Peru, Bolivia, Ecuador and Chile and the inclusion of the vicuña as a species with a high risk of extinction in the list compiled by CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) to prohibit the hunting of the vicuña and the sale of its products.

In 1995, the Peruvian government set up regulations regarding the treatment of vicuñas and their status as commercial property; the rural communities were acknowledged as those chiefly responsible for the conservation, care and beneficial use of the vicuñas.

Fortunately, it may now be said that the vicuña has been saved from extinction. Peru is home to 80% of the planet's vicuña population, and the animals are cared for in accordance with a strict set of rules. This has enabled their beautiful fibre to reappear in the world's most prestigious shop windows.

The period of the Conquest

The Spanish conquest of the Inca Empire brought an end to a society in which the central concept was Mother Nature, repre-senting the principal religious virtue.

The South American camelids, and particularly the vicuñas, almost reached the point of extinction. New species were introduced from Europe, bringing diseases with them and consuming the natural pasture. Hungry men, condemned to working in the mines and deprived of their beliefs, turned to hunting the vicuñas in order to survive.

It is estimated that during the Spanish viceroyalty almost two million vicuñas were eliminated.



On this gorgeous fall day, I am sitting here watching our last gang of cria. They have so much youthful, playful energy. They chase each other. They check on each other. There is usually a bully but there is always one that sets the group straight and gets them all pronking together again, and this years' gang is no exception. Our youngest cria, Amelia, is the smallest but tries her best to keep up and often in her quest to keep up her upper body gets ahead of her legs and she goes tumbling only to spring right back up and continue her quest. These moments are some of my ranch favorites. Another one of our favorite ranch moments is watching a group of young visitors experience this sight for the first time. Watching nature have fun is powerful!

Our cria gang dynamics are not much different than a group of young people. We have had the privilege to host many people to our ranch young and old. Combining the youthful, playful energy of cria with the youthful, playful energy of kids is a synergistic experience I encourage all to try. It can be overwhelming to host a group of young people if you have not had much experience working with youth. There are three principles I would encourage you to adopt if you choose to host a group of young people.



- 1. Plan the work, work the plan. Your plan should include a timed schedule, but it also needs to include a list of supplies that are needed for the group and a list of supplies that need to be prepared for each individual. These supplies need to be prepared ahead of time so that as your visitors arrive you are ready to spend time welcoming each of them. We host a fibre camp each summer and our plan and to-do list preparation begins months in advance. If you have more than one adult helping host the event (which I HIGHLY recommend), delegate the work according to each persons' speciality. Each of us have our own skill sets and when the work is split up by areas of strength the workload feels lighter.
- **2.** 80/20 Rule. There are so many great things that can be done on a ranch tour. Our favourite is to have our visitors create something with alpaca fibre or yarn. We also have a walking trail with educational stations where visitors can learn about alpacas, their fibre and their care. Young people love to move and interact much like our cria. We have had visitors create art from raw fibre and create art from alpaca yarn. When hosting youth we follow an 80/20 rule. 20% of the time is instruction and explanations, and 80% of our time should be hands on letting these young minds imagine, create, and interact. Often, as adults, we err by spending too much time talking or instructing. A written out schedule allows us to be intentional and mindful of the amount of time we have planned for instruction and for creation and movement.
- **3.** Be present, be adaptive. When your visitors arrive, take a deep breath and be fully present. Every plan has moments you need to adjust and adapt. Remember that when working with youth, being 100% engaged in their alpaca experience goes a long way to creating a successful event. Youth are very forgiving. It needs to be said again, youth love to imagine, create, and interact. At the end of the event they will remember the creative community time. They will remember interacting with each other and with our wonderful animals. They will not remember if our wonderfully crafted plan needed to be adjusted or had flaws. They will remember the time spent with you. It is so important that our youth have time spent with adults where we just enjoy them and our time spent with them. Adjustments will need to be made to every plan. If every adjustment prioritizes compassion and community, you will host a successful event!

Kumihimo Braiding

Sample Kumihimo Braiding Lesson Plan

Objective: Participants will create a zipper pull or key chain flair using the Kumihimo braiding method. Allow two hours.

Materials Needed (per participant):

Kumihimo disk

Zipper Pull Hardware (9 mm split ring and 1" lanyard hook)

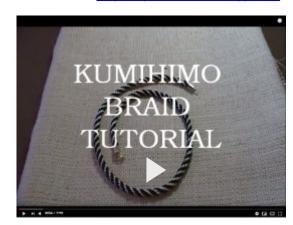
2" piece of yarn for center tie

Ziploc bag for supplies

Pre-cut yarn strands -- multiple colors - each strand should be approx 38 cm (15 inches).

Approx Time Allotted:

- **1.** 10 15 min Sitting in a circle, go around and introduce each other with a fun question for each participant to answer.
- **2.** 10 min Show and Tell Pass around some braid projects you have completed and share the history of Kumihimo braiding.
- a. History of Kumihimo Link https://www.interweave.com/article/beading/kumihimo-origin-facts/
- b. Tutorial Video Link https://youtu.be/suUcFpj4OsA



- 4. 10 min Distribute supplies
- a. Have each participant choose four, 38cm (15") strands
- b. Pass out bag of supplies
- 5. 60 min -Braid!

Depending on the ages of the participants, you may need a few adults to volunteer to help out with the activity.

Fun and Easy Activities for Visitors





Photographs courtesy of Cari Corley

Cari Corley has fallen in love with all things fibre! Cari had no idea when they purchased their initial alpacas she was beginning a creative journey that would open a world of possibilities and a community of (com)passionate makers. Cari oversees all things fibre at Alta Vida Alpacas and develops the fiber curriculum for their non-profit, Alpaca Partners. Cari is passionate about exploring career opportunities for individuals with special needs in the fibre arts. She is a born maker. (In her spare time...she teaches High School math and sponsors National Honor Society.)

Republished courtesy of Purely Suri a publication of the Suri Network of the USA

Wet Felting Soap

Wet felting soap is a fun and messy - yet clean! - activity enjoyed by all ages.

You will need:

- a selection of carded, feltable fibre (huacaya and wool work great for this, suri less so unless mixed with another fibre)
- one or two bars of soap per participant
- hot water
- cold water

Begin by having your participants lay out the fibre they want on the outside of their soap in a single, very thin layer, just large enough to wrap around the soap. Have them align the fibres in one direction. Have them then lay out two additional, very thin layers on top of the first, with each layer's fibre perpendicular to that below it. If the layers are too thick, the fibre won't felt down properly.

Wrap the bar in your fibre layers. Starting with either cold or hot water, the participants should gently pat the fibre all over the soap bar with damp fingers until it begins to cling together. Adding water as needed, begin rubbing the bar all over in both back and forth and circular motions (don't forget the corners!). Once the fibre begins to shrink, "shock" it by immersing the bar quickly in whichever temperature water you did not start with, and continue rubbing. If mess is a worry, put the bar of soap in a ziploc baggie to contain the suds.

Continue alternating hot and cold water with rubbing until the fibres have shrunk tight to the bar of soap. It's now ready to let dry and then use - soap and a gently exfoliating washcloth all in one. Like all soaps, your felted soap should be allowed to dry out between uses. The felt will not mold or mildew, and will continue to shrink as you use your bar.

Many thanks to RaQuion Braxton, Kate Burkett, Meredith Keenan, Josua Lutian and Riley Whitmyer for allowing me to document their soap making fun!

Photographs courtesy of Jill McElderry-Maxwell.

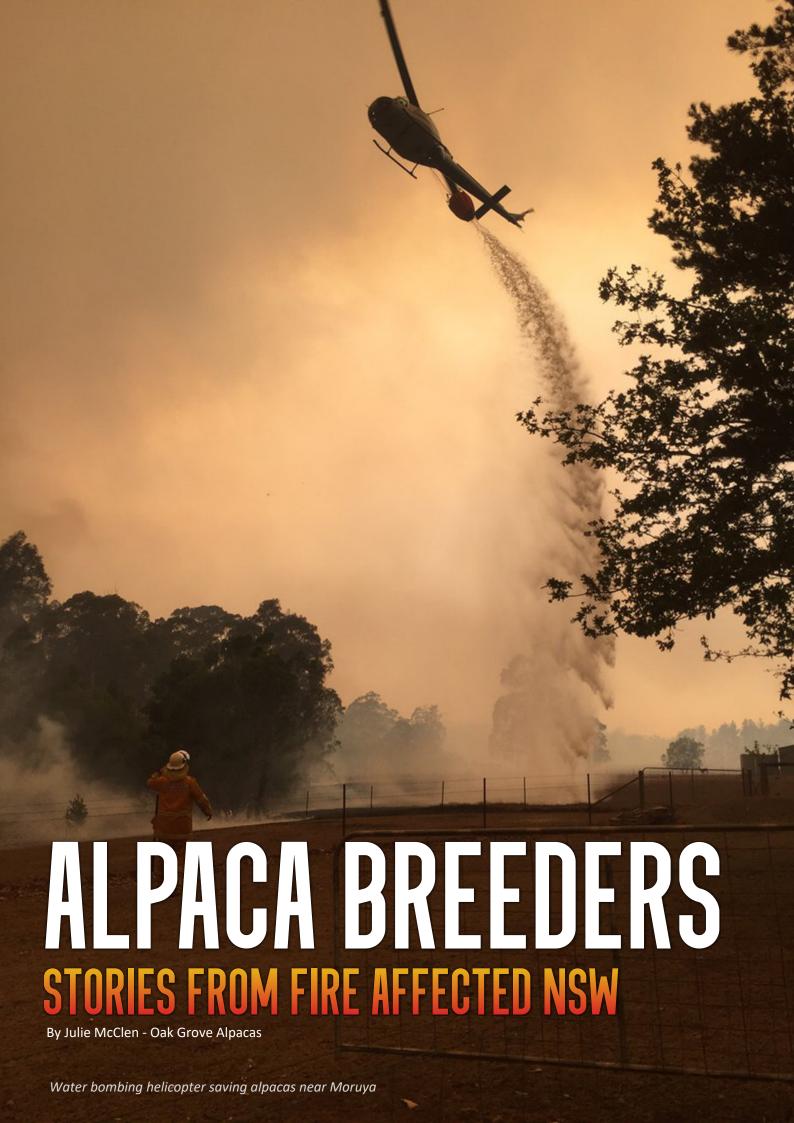












On New Years Eve the south coast region of NSW experienced the start of what was to become six weeks of living with the constant threat of bush fire, and many experiencing first hand fires' devastating effects.

We share the stories and images from that time from four alpaca breeders located in the region, all affected in some way yet living hours apart, the fires were that extensive.

Our farm is located fortunately in a larger cleared dairy farming area within the Bega Valley, normally a lush green place surrounded by ocean to the east and the Great Dividing Range to the west. The rolling hills that extend down from the mountains are mostly National Park or covered in eucalypt forest.

But after months of ongoing drought on and off for the last two years, the valley was tinder dry and the grasslands brown from the Summer heat.

We luckily did not have fire reach our farm, but we had friends evacuate their alpacas or themselves here on three occasions during the six weeks we lived with the fires surrounding our town. Another of our fellow alpaca breeder friends were first to be affected on New Years Eve, fleeing at 1am in the morning from a fire ball raging toward them from the forest to their west, a fire that was not predicted to arrive until later on New Years Day. They left their large herd of alpacas, cattle, goats and sheep, grabbed their two dogs and fled to what they thought was the safety of the historical south coast town of Cobargo.

Some hours later, they awoke from sleeping in their car to find flames all around them as Cobargo was being impacted by a fire nobody expected to see there. The fire burnt to the ground many of the towns historical wooden buildings. They then fled to the evacuation centre set at the beachside town of Bermagui, where they were stranded with no phone or internet. The fire was so extreme and out of control they feared they had lost their home, their farm and all their animals. The wait was excruciating, taking days to find out what was left if anything due to the difficulty of even getting into the property. The RFS fire map showed their property was in the impact zone.

Trees had fallen over the roads and others were in danger of falling, spot fires were still appearing in the fire zone and thick smoke made driving hazardous. Three days after the fire swept through their town their neighbour managed to use his tractor to make his way into their property, to find their home was still standing and their livestock were alive, despite every fence on the property being burnt and the paddocks mostly black and scorched. Sadly the neighbour had lost his home, although his cattle survived.

For this breeder the back breaking and financially devastating cost of feeding animals on burnt pasture, and rebuilding infrastructure will continue for the rest of this year and beyond.

Then around the end of 2020 they will be faced with an additional cost - the one of DNA testing any cria born from the results of their 5 males (3 studs and 2 yet to be certified) running with their herd of females for 2 weeks after all the animals combined once the fences burnt down. They would no doubt have harrowing stories of survival themselves if they could speak. Sadly they did lose one alpaca to trauma from being burnt and another had minor burns but will survive.

The cost of DNA testing is \$280 per cria and they estimate a potential drop of up to 30 cria conceived during the fires - that is a huge cost of \$8400 to ascertain the sire, then the added cost of certification if none of the registered males prove to be the sire for some of these cria, and the up and coming boys managed to start their stud career earlier than planned.

This breeder also did not see electricty return to their property for 5 weeks after the fires first came through, and with limited communications were also affected by isolation. I kept in contact with them via Facebook messaging to share current fire updates as the fires continued to rage through our valley, sent them latest RFS fire maps and weather predictions, located hay distribution near them and offer a point of contact, a chance to come here for respite and a hot shower! Many people experienced the tragedy of losing their homes & some even their lives. Others have suffered losses that are not so obvious, but still have a profound affect on their ability to return their properties, and their mental health to pre fire condition.

RESPONSE FROM THE AUSTRALIAN ALPACA ASSOCIATION Over the past few months we have watched with increasing concern as our members have not only been suffering from these dreadful fires but also have to cope with the challenges of maintaining their farms in drought. As a board we are monitoring what is happening and, with the support of our office staff, we are continuing to lobby government to provide support for our members during this time. We were asked to submit recommendations for assistance for our members to (former) Minister McKenzie. We are aware that some of our members do not fall within the criteria for some grant payments and acknowledge the added stress that this may cause them and we are making sure that government is aware of this issue. Through the CEO via facebook we have had regular updates on various grants, assistance and help. Board members have, where possible, attended

Over the next few weeks and months we hope to provide information and a possible forum for members that may help them as they start to rebuild their properties, land and lives. We will also, shortly, share advice that we have requested from Dr Jane Vaughan regarding the effects of smoke on our alpacas. Any alpaca breeders affected directly by the fires can contact Amanda Olthof by email amanda@alpaca.asn.au

community meetings following fires, to ensure we have been able to meet with our

Another alpaca breeder further north in the Eurobodalla shire almost lost their property when fires came out of the forest after several days of spot fires.

members.

They rang 000 and luckily the RFS was close by and came to their property with multiple firefighting vehicles that were supported by water bombing aircraft as per the photo at the start of this article. Their property is located at the end of a road at the base of the forest, so without the RFS turning up in such a timely fashion it was likely they would have lost so much more than burnt paddocks & fences that now need to be replaced at the cost of tens of thousands of dollars.

During these weeks of constant fire threat and days in between of anxious waiting for the next 'bad fire weather day', and praying fo rain to come and end the drought and put out the fires, we endured many days of heavy smoke across the whole of the south coast. Days where a mask was required to leave the house and the world around us took on an orange glow with the smell of smoke and fine ash pervading every corner of the house as shown below.

On the weekend of the last awful climax of this fire season before the rain did come, we had friends who live just 12km's away evacuate here for 4 days, with their alpacas, 3 dogs and possessions loaded into their cars.



The top of a fence post left hanging in the fence after it was burned



As we sat and watched local council video updates from the RFS on facebook together and scoured the Fires Near Me site for any change in the fire spread, watched wind sites, hotspot sites and listened to the RFS radio scanner for updates, we found the waiting was the worst of all. The hours passed, our friends returned home to check their property well before the fire was due to impact, and they returned with nerves frayed as they told us about the sound like freight trains roaring down the mountain toward them, and seeing the fire starting to burn the mountain behind their home.

Whilst outside checking our fire prep and feeding our alpaca herd, we could even hear the rumble of the fire in the distance. Tears flowed one time when it looked like our friends had lost their home, but after a trip down to the local RFS it was confirmed that the RFS had managed to save their home. Relief spread across the faces of everyone present.

During this campaign fire event as the RFS calls it, we had on average once a week an extreme fire risk day where the RFS put out worst case scenario fire spread and ember attack prediction maps. One of those had the embers at our street, but luckily they did not reach this far. However another map showed the Border fire that crossed from VIC into NSW spreading only about a third of the distance the fire actually travelled that night, destroying small villages in it's path south west of Eden. This experience left everyone in a state of constant anxiety, not feeling confident that the maps were accurate, constantly looking out of windows if smoke started to thicken or at night to see if the glow of fires in the surrounding mountains were getting any closer.

It takes many weeks and months, or even longer for some people, just for the anxiety levels to drop back to normal. The constant state of stress causes health issues, sleepless nights and nightmares when you do sleep. The fires down in this part of NSW are not yet, as of late February 2020, fully out. Fire still lingers in tree stumps that have the potential to reignite as we did not see the huge rainfall totals that further north in NSW received. But for now at least, the threat is contained to mostly small isolated pockets within the heavily wooded or steep terrain areas, and our wonderful Rural Fire Service personell are still working tirelesly to end this fire season that has impacted so many in this region.





4.30pm in the afternoon, smoke from the border fire rolled in creating a solar eclipse and fine ash fell from the sky. Day turned to night within 30 minutes.



ABOVE: Alpacas that were saved by the RFS covered in ash.

LEFT: Paddock gates collapsed after supporting posts are burnt off at the ground, allowing stock to roam freely.

PULPY KIDNEY (ENTEROTOXAEMIA) A DEADLY DISEASE IN ALPACAS, SHEEP, CATTLE AND GOATS

By Ourimbah Vet Hospital

We see a number of deaths from enterotoxaemia when we have longer than usual warm weather, together with plenty of rainfall that creates ideal conditions for this disease to occur.

What is Enterotoxaemia?

Enterotoxaemia (commonly called "Pulpy Kidney") is caused by the overgrowth of a particular species of bacteria (Clostridium perfringens) in the intestinal tract of many species of animals, including alpacas, sheep, cattle and goats. This bacterium produces a very potent toxin which causes severe systemic disease, leading to rapid collapse and death. There are usually no warning signs and there is no effective treatment. Typically, animals appear perfectly healthy one day and then are found dead the next. In some cases the course of the disease can be a bit slower – up to a day or so – but the end result is always the same.

Deaths from enterotoxaemia occur mainly in the spring and summer months when pastures are green and growing rapidly. Alternatively, they can occur after a change of feed, especially if there is an increase in the amount of fresh green grass or hay being fed or if animals are moved onto fresh pasture. These kinds of feed seem to set up conditions in the animal's gut which favour the growth of Clostridium perfringens. You can reduce the chances of enterotoxaemia

occurring by not making any sudden changes to the type of pasture or hay your animals are getting.

Prevention

The good news is that most cases of enterotoxaemia can be prevented by vaccination. 5 in 1 and 7 in 1 vaccines protect against Clostridium perfringens Type D, which is the most common strain. There is also now an 8 in 1 vaccine, which covers some extra strains of the bacteria*. We have seen some cases where people lost animals that had been vaccinated with 5 in 1, but the losses ceased when they started using 8 in 1. Incidentally, these vaccines also protect against other clostridial diseases, including tetanus and and blackleg. In our area (central coast NSW) these other diseases tend to occur less often, but they are just as deadly!

Vaccination is the key!!

It is important to vaccinate animals before they are exposed to the disease and to make sure they have regular boosters. The initial course is 2 doses given 4 to 6 weeks apart. This is usually started at about 6 weeks of age. Sheep and cattle should have boosters every year, but for alpacas and goats it is recommended to give them boosters every 6 months. 5 in 1 vaccine is quite cheap and does not have to be given by a vet. It is also quite safe to vaccinate at the same time as doing other procedures such as worming, so you can make it part of your routine management.

Please feel free to get in touch with us if you would like any more information about enterotoxaemia, or if you would like any help in setting up a vaccination program.

* Editors note - please check with your veterinarian regards 7 in 1 or 8 in 1 suitability for alpacas.



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We have been making alpaca and chicken liquid manure for about 12 years, after seeing how the grass growth around the alpacas toilet area became greener, taller, more dense and with deeper root systems than the surrounding pasture. The fact that our cattle and alpacas gravitated to these areas when moved into the paddocks convinced us that we should treat all our paddocks to "paca poo magic".

Before commencing making the fertilizer it is a good idea to watch a short 5 minute video by John Wicks called "The Years Project" - it provides convincing evidence that applying compost to pastureland results in long lasting benefits, including bountiful grass and sequestration of carbon in the soil.

Camelids are tylopods with three stomach compartments, the rumen, the omasum and the abomaseum. They convert grass and hay into energy quickly and eat far less, as a percentage of their body weight, than other farm animals. Their dung is lower in organic matter but has enough to improve soil texture and water holding capacity. Llama poo aided the Inca civilization and powered Machu Picchu's crops. View article of interest here in Smithsonian Magazine.

Camelid poo is relatively high in nitrogen, phosphorus and potassium but it can be used directly on the garden without burning plants. However, we prefer to compost our alpaca and llama poo because it can sometimes contain weed seeds. Piling it under black plastic for six months allows the worms to do their job and create a dark friable soil so it is easier to pick up, plus, like humans they poo and pee in the same area.

Making liquid manure is very simple, you need a large bucket or container, with a lid. Put the poo into the bucket, about 1/4 full, and fill with water. For those of you with access to tank, stream or bore water, use this. I will have to use chlorinated tap water. Stir well and secure the lid. If the container is white, keep it out of direct sunlight.



Stir daily, with a large implement for the first week and then twice weekly until ready, about three weeks or more. (If you want to get as much out of this as possible put some gloves on and get in there to break up what is floating on the surface.) Then sieve. Put the liquid fertilizer into containers and the slurry into the compost bin or directly on the garden. When using the fertilizer we recommend a ratio of 1 fertilizer to 10 water, for the garden and 1 fertilizer to 4 water for paddocks. Spraying equipment depends what you have on hand. We use a trash pump which can take some solid matter without blocking up.

Making use of Mother Nature takes a bit of time but it's hard to beat the cost or efficiency.

Right- Getting water in to the tanks







Below- Grass around alpaca toilet



Big Sky Stallone's broken leg

By Michelle Malt - Big Sky Alpacas

Stallone was born to a maiden female a few weeks earlier than expected, based on mating dates, so I had been monitoring him fairly closely. We had another male cria a few days younger, in addition to two female cria (one orphaned), and the maternity group also comprised a couple of tui females. Our orphaned cria was still on bottle feeds, and I had been 'topping up' Stallone with the occasional bottle as he hadn't been gaining weight at a rate I felt comfortable with.

It was mid December, when stormy weather is not uncommon. The group had access to a shed, but it was a tight fit for everyone to be undercover. The previous night there had been a storm, and my mother-in-law had reported that each of our herd groups had taken shelter during the storm. Having been away for a couple of days, I was keen to check on Stallone, and as I walked into the paddock he wasn't in a hurry to stand, which concerned me even further. I assisted him, and then I noticed that he wasn't bearing any weight on his left hind leg, and it appeared to be "swinging in the breeze". I knew that this was not normal, so I carefully gathered

him up, placed him on a dog bed in the back of my car, and called the vet surgery as I drove from the shed to the house. We are located just over an hours drive from our vet surgery, so we determined an approximate arrival time, and my father-in-law drove the car while I nursed Stallone, supporting his leg as best I could.

I had decided to purchase "The Glove Box Guide to Alpacas" by Dr Jane Vaughan as a Christmas present for our vet practice, and as luck would have it, it had arrived in the mail that day. I took it into the surgery with Stallone, and explained to our consulting vet that it was their Christmas present, and I thought it might come in handy that day (it did!). After an examination and several X-rays, it was determined that Stallone's leg was broken. We discussed options: to splint and bandage (not recommended as suitable given the limb could not be immobilised); surgery to repair — which had not been performed on an alpaca at our surgery before, but they were prepared to try; and referral to a specialist — with some uncertainty as to whether the referral practice would attempt surgery on an alpaca.



I made a few phone calls to fellow breeders to seek advice on whether they had been through similar experiences, and if so, what the outcome had been. I didn't want to put Stallone through surgery and recovery if a successful outcome was unlikely, and yes, cost was a consideration too.

I'd like to thank Natasha Clark from Kurrawa Alpacas for her advice, and for recalling that Margaret Hassall from Double-H Alpacas had some experience in this type of injury, and fortunately I was able to speak to Margaret quickly and she advised there had been several successful recoveries from broken legs — rear and front legs — in their herd over the years.

The decision was made to proceed with the operation, and with some trepidation, we left Stallone at the vet surgery and travelled home. (Mind you, he was in safe hands, and receiving lots of attention.)

On arriving at the surgery I was taken through to see Stallone and was given an update on what had transpired during and post surgery. It was a relief to see him awake, and sporting a bright wrap bandage on his leg. Phil advised on recovery and medication requirements, and we headed home.

Having no idea how Stallone had broken his leg, I was apprehensive about leaving him with his dam, as one possibility was that she had kicked him. (The other options were general larking about with the other cria, or that he had been accidentally stood on in the shed while the herd was sheltering from the storm.). I am pleased to report that his dam was incredibly patient with him, although she did not appreciate being confined to a small area (necessary to keep him relatively immobile while the leg healed), although the additional food rations provided her some consolation. After a few days we would allow her access to the adjacent paddock while keeping Stallone confined, which worked well. I noticed that he was able to nurse from her, and that when he was sitting, he would prop the broken leg out to the side. I had purchased a pet playpen for our orphan cria a few months previously, and we put Stallone in this on the grass during the day to give him some sunshine and allow his dam to graze. Administering his medications was easy enough, and his anti-inflammatory medication was followed by a bottle to ensure it wasn't on an empty stomach.

On Christmas Eve we took him back to the surgery for a follow up, his mobility was good and he was bearing some weight on the leg, however it was decided to leave the stitches for a few more days and we would remove them at home. Removing the stitches went smoothly, and we continued his anti-inflammatory medication until his next check up on 10 January, when a further X-ray confirmed that the break was beginning to heal. He came home to a further period of confinement with his dam, until his further check up on 24 January. I had been weighing him to ensure he was gaining weight, and providing supplementary bottle feeds. At this check up he had the pin removed, and it was a nervous wait to hear that he had woken from the anaesthetic.

On return home Stallone was able to move around freely, although he did appear to be slightly favouring his injured leg. He remained confined in a small, flat paddock with his dam, and away from the other cria. In March he and his dam returned to the maternity herd, and although his broken leg had shorter fleece, as a result of being shorn for the surgeries, he showed no favouring of the leg or restriction of movement.

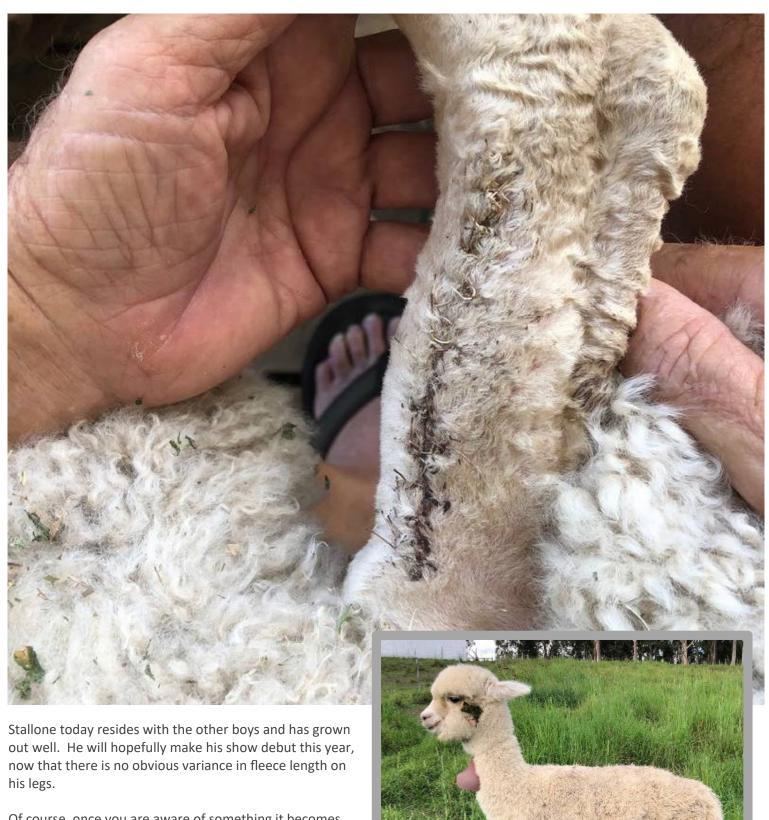
At shearing time in early September we restrained him by his legs as would normally be done, however my husband held his rear left leg so that he couldn't move it excessively and it was supported. He showed no change in movement after shearing.











Of course, once you are aware of something it becomes more common, and other breeders also shared stories of broken legs on Facebook, which helped me realise we had probably been lucky. I believe his young age at the time of the break and his recovery also contributed to a good outcome. I'm incredibly thankful for the excellent care Stallone received from all of the staff at Casino Vet Clinic, and the support and advice I received from fellow breeders.

NEXT ISSUE: We continue the story with the vet's perspective and technical explanation of how they repaired Stallone's broken leg.

ALPACA CRIATETH

By Allison Quagliani

Incisors

Alpaca crias are usually born with their first two front teeth, the other four baby teeth erupting over the next six months. These first incisors are deciduous incisors and they will be replaced starting at around two years old by permanent teeth. By four years old the alpaca will have all of its permanent incisors and should have lost all of its deciduous incisors.









Australian Alpo Youth Education

By Julie Blake - AYE chair

The AAYE are focused on fostering a healthy understanding of "All Things Alpaca" to the youth of Australia. In a positive, safe and nurturing environment.

Beginning with young handler classes, a gentle approach is adopted, where all children can lead an alpaca and learn basic alpaca handling skills. Its loads of fun and there are often prizes and ribbons for participation. Fun games and simple marked courses are usually involved. Check out our Calendar of events in the Youth section on the Australian Alpaca Association website.

The Young Paraders Competition is the progression from young handlers. It offers young people interested in alpaca careers, the opportunity to compete in alpaca related events. Both inexperienced and experienced young people between the ages of 7 and 22 can get involved.

The young Paraders Competition incorporates two distinct areas, Showmanship and Stockmanship. Within this, there are three levels of experience and several different age groups.

We also have Master trainer and Young Judges competitions, as further skills and knowledge are acquired. You can find out more here https://alpaca.asn.au/youth/

This competition is designed to highlight the bond that develops between alpacas and their handlers and the skills required for their management.

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AAYE also offer education in the form of camps and workshops. These are great relaxed opportunities where hands on activities encompass such things as farm management, husbandry and biosecurity. And then there are topics covered like public speaking and first aid. Mock plays, movie/game nights and obstacle courses. There are often craft sessions, usually fibre related, like dying or felting. We have inspiring, committed adults and amazing young people that make each event a unique and positive experience. Contact your State representative for information. https://alpaca.asn.au/australian-alpaca-youth-education-committee/

These programs are on offer to all youth, whether you own an alpaca or not. The friendships formed between the youth themselves, with a common interest of our beautiful, inquisitive, alpaca companions, are truly amazing!

Schools and colleges with an agricultural program are offered free membership through our Alpaca association.

Youth membership with the AAA is \$50 annually. Family memberships are also available where the second child is \$25 and third and subsequent youth members from the same family join at nil cost.

Contact the AAA for more information regarding youth membership at info@alpaca.asn.au.

Alpacas in the Community

The thing I love about Alpacas is that they make everyone smile. One of the special things I have been able to do is take Alpacas to some special events where they have helped break social barriers.

The first event I took alpacas to was a 'Melbourne Show Day" at the new Mercy Montrose aged care facility. We took three of our animals along, Jasper, Ferdinand and Minstrel. They are all friendly animals and used to being around people and taken to different places.

We set up a pen outside the building and all the residents came down to sit in an outdoor area. They all got to walk past the Alpacas and were able to come up close and touch their fleece. It made them all happy to see such cute animals. Some of the people had dementia and they kept saying the same thing. But that was ok.

For the show day they had entertainers and dogs to start off the show. After the magician, I took Jasper around to all the residents on a halter. Even when dogs barked at him, he kept calm. Everyone really loved seeing and touching the Alpacas. I am sure it is something they will remember.

The second event I took Alpacas to, was to a charity lunch on Christmas day. This was for the Ferntree Gully Community Christmas day lunch run by Foothills Community Care. They make a lunch for people who are lonely or can't afford food for Christmas lunch. We took Jasper and Nova along to meet them. Everyone really appreciated seeing them and the kids really loved it. There was an older man who was really excited and engaged to see the animals. It was great to help people enjoy their Christmas day.



Alpaca youth Paraders activities

By Sophie Veenstra

My passion lies with promoting my animals and using their fleeces for craft.

On May 20th The Geelong Advertiser photographer came for a photo shoot advertising The National Library Day when the story of "Alpacas with Maracas" would be read simultaneously at 10.30am on May 22nd all around Australia. Roger and Galaxy were the models.

On May 22nd Mum picked me up from school to go to Geelong West Library to meet about 40 kindergarten children and all the shoppers who walked past. Galaxy and Roger behaved well even with all the attention. We had a bag of fleece and a toy Alpaca to show the people.

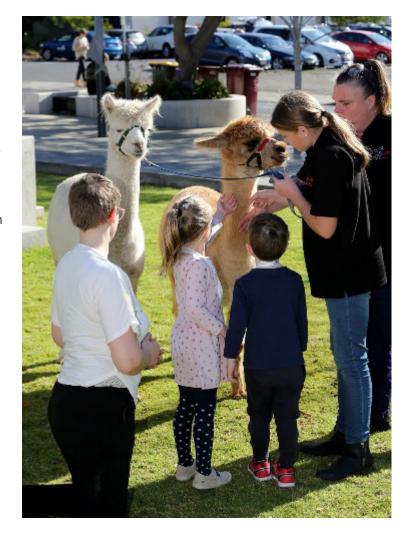
Alpaca Youth Events to look out for:

7th March – Paraders at Red Hill Show – Convenor: Rachel Burdett Ph 0432398160

8th March – Paraders at Goulburn Show – Convenor: Katy Armson-Graham Ph 0416302227

27th March – Paraders/Young Judges Comp. at Camden Show – Convenor: Robyn Hayward Ph 0414977226

10th- 12th April – Sydney Royal - Convenor Ruby Williams Ph 0439389994





ALPACA EVENTS

AUSTRALIAN ALPACA ASSOCIATION

(For details see Assoc website www.alpaca.asn.au)

Red Hill Show - Saturday 7 March 2020

Age Championship Show for halter class only.(Note: Fleece classes are not scheduled). Judge: Natasha Clark Apprentice Judge: Lisa CharterisShow Entries: now open on eAlpaca Entries Close: Monday, 24th February 2020 Convenor: David Daddo 0429 962 509

Boowora Show -7th March 2020

Convenor is ROSIE FRANCIS who can be contacted at rosiered@usa.net (available from 9:00am to 8:00pm) Judge is Amber O'Neill

Wodonga Alpaca Show – 14th March

The Wodonga Show brings you a family friendly Day Out. Come along to the Wodonga Showgrounds- so much to do and see- Agricultural Show. The Convenor is Julie Hofer and the Judge is Natasha Clark.

Mount Pleasant Show 2020 - 21 March 2020

Mt Pleasant Showgrounds. This show will have exhibits of Fleece and Halter classes for both Suri and Huacaya alpacas.

Moss Vale Show - 22nd March

Entries close 1 March 2020. It is an Age Championship show and the entries are now open on eAlpaca. Convenor is Sharon Dawson who can be contacted at jennjoley@bigpond.com (available from 9:00am to 5:00pm) Halter Judge is Jillian Holmes

Farm World 2020 - Thursday 26th March to Sunday 29th March 2020. Farm World is a 4 day event held at Lardner via Warragul. . Eastern Region have exhibitors displaying animals and many product examples from bags of fleece to knitted garments both handmade and imported, craft examples, leading brands and fine Australian Alpaca garments, & daily spinning demonstrations. Come and join us for a fun filled four days of "talking alpaca". For more information refer to the Booking Form.

VER Alpaca Workshop - Introduction to Alpaca Workshop
Open to those wishing to own alpacas or learn more about
looking after their alpacas. This is a hands-on event and you
do not need to be a member of the Australian Alpaca
Association to attend. Sunday 26 April – 10 am to 2.30 pm
Venue – Auravale Alpacas PO Box 5108 Braddon ACT 2612
BYO – Lunch - Morning Tea/drinks provided Cost – \$20/head
or \$35/Double. Topics to be covered - Halter Training, Float
Training, Restraining your Alpaca, Toe Nail Care,
Conformation, Ear Tagging, Oral and Injection Administration
Bookings essential – Bookings to be made directly to Lynda
HoldsworthMobile – 0419334276 Email –
queries@auravalealpacas.com. Will be undercover if wet.

NEW ZEALAND ALPACA ASSOCIATION

(For details see Assoc website)

Levin Show (Franklin Show) - 16 Feb Judge Lisa Charteris - (Breed) | Closing 31st January 2020..

Temuka & Geraldine Show - 07 Mar Judge - Diane Marks (Breed) | Closing 10th February 2020..

Morrinsville Show - 07 Mar Judge – Sarah Busby. Apprentice Judge – Sandra Baerselman | Closing Date 12th February

Kumeu Show - 14 Mar Judge - Angela Preuss (Breed) | Closing Date 26th February 2020

Northern Region Colourbration - 27 Mar - 29 Mar Judge - Shane Carey, Apprentice Judge - Sandra Baerselman, (Breed & Fleece) | Closing Date 6th March 2020

Malvern/Sheffield Show - 28 Mar Judge - Amber O'Neill (Breed Only) | Closing 28th Feb 2020

Oxford Show - 04 Apr Judge - Molly Gardner (Breed) | Closing 28th Feb 2020

Auckland Royal Easter Show - 10 Apr Judge: Marc Mullette (Breed & Fleece) | Closing 19th Mar 2020

MacKenzie Show -13 Apr Judge - Dean Ford and Lisa Charteris (Breed & Fleece) | Closing Date 1st April 2020

RAS Golden Fleece Show - 09 May Venue: Rangiora Showgrounds | Judge: Dean Ford

2020 Camelidynamics

Handling and training your alpacas 1-day workshop

with Alicia Anderson Training Date: Sunday 29 March

Time: 9am to 4pm

Venue: 191 Eagles Road, Harcourt VIC (near Castlemaine)
Price: \$150 includes notes, morning/afternoon tea and lunch

Sydney Royal Alpaca Show

Natasha Clark – Halter Judge 10th – 12th April Andrew Munn – Fleece Judge 28th March Entries through ealpaca.com.au

HANDLIN' THE WEANED



Reproduced courtesy of Alpaca World Magazine UK

The sight and sound of alpaca dams moaning and fixing the breeder with an accusatory stare and whining cria working on their best Houdini escape route, is upon us. It is weaning time.

Weaning is the separation of mothers and their cria and usually takes place when the cria is five to six months old. Occasionally it might happen earlier if the cria is very large or the mother is in poor condition. Cria that are small for their age often do better when weaned on to concentrates.

Weaning enables the mother to stay in good condition and put her energy into the foetus rather than nursing the existing cria

The majority of cria will weigh between 30 and 40 kilos at five to six months and most will already be tucking into hard feed, eating grass and hay and feeding less from their mothers. It is important for the dams to wean to ensure the healthy development of the foetus as for the first six months it is very small and it is in the last five and a half months that it grows to its birth weight. Weaning enables the mother to stay in good condition and put her energy into the foetus rather than nursing the existing cria.

Leaving cria with their mothers can bring new problems as when the dam births the cria at foot may well try to suckle, depriving the newborn of the crucial colostrum it needs to survive. A new born is no match for a yearling! I have seen this happen even when the older cria appeared to be well and truly weaned and put back into the main female herd.

The other problem is the boisterous nature of the young males who may try to mate the heavily pregnant females and generally irritate them.

Weight issues

Weaning is stressful so care needs to be taken with the weanlings' nutrition, weight gain and general health. They will need their regular ADE vitamins to see them through the dark months and it is worth seeking veterinary advice as to whether they need to be wormed or treated for coccidia. Regular weighing and body condition scoring will help to highlight any problems.

Not all alpacas will eat the feed but as long as they are gaining weight and healthy that is not a problem. Eventually they all seem to take to it. Make sure they have plenty of trough space so that they do not have to compete for food.



You might want to weigh the cria at five months to work out which ones can be weaned then and which you need to leave for another month.

It is probably better to separate the sexes at this point if possible and run male and female weanling herds. This is not strictly necessary but they should be separated by the time they are a year old, or earlier if the males start sitting on the females. You would not expect males to start working until they are two or three year olds but there are exceptions.

Choose clean fields preferably out of sight of their mothers with adequate fencing to prevent any escapes. Some breeders will have non-breeding older females who 'look after' the young girls and geldings for the young boys. It can be a bit heartbreaking as the mother cria bond is very strong but they will settle down.





PREGNANCY LOSS IN THE ALPACA

Reproduced courtesy of Alpaca World Magazine UK

Losses arising from abortion are distressing for owner and animal alike and are a financial set back. Well planned breeding programmes can be severely disrupted with knockon effects for the genetic development of herds and breeders marketing initiatives. Ahmed Tibary, DMV, PhD, Dipl. ACT, of the Veterinary Teaching Hospital, College of Veterinary Medicine, Washington State University, outlines some of the causes and consequences associated with this problem.

Pregnancy loss is the second most common complaint in alpaca infertility in my practice. There is no epidemiological data on the extent of this problem. However based on records in the theriogenology service at the Veterinary Teaching Hospital, Washington State University, 7–12% of all pregnancies will be lost during the 11–12 month gestational course. From a clinical point of view, pregnancy losses can be divided into three categories; early embryonic death; early fetal loss and late fetal losses.

Diagnosis of the cause of pregnancy loss is one of the most challenging aspects of infertility work up. It requires the services of a veterinarian with a good background in theriogenology (a veterinary speciality dealing with infertility, obstetrics and neonatal problems), and an excellent diagnostic laboratory support. The objective of the present article is to discuss the causes, diagnostic approach and possible therapy for pregnancy loss in alpacas.

DEFINING THE PROBLEM: THE IMPORTANCE OF PREGNANCY DIAGNOSIS

When discussing or working up a case of pregnancy loss it is important to define the precise problem in terms of whether this is an individual female problem or a herd problem, when does the loss occur and what are the historical data of importance that happened before observation of the pregnancy loss. Talking about pregnancy loss suggests that a female has been diagnosed pregnant at a first examination and is found open at a subsequent examination. Therefore, of utmost importance in defining the problem is what method is used to diagnose pregnancy in the first place.

Pregnancy can be diagnosed by a variety of methods and is most commonly based on female behaviour, hormone assays and ultrasonographic examination of the uterus and its content. I consider ultrasonography to be the gold standard method for any examination for pregnancy

I consider ultrasonography to be the gold standard method for any examination for pregnancy. For a well-trained person, ultrasonography carries a very high accuracy (100%) starting at 12 days post-breeding (Figure 1) when done trans-rectally and starting at 45 days (Figure 2) and up to 5 months when done trans-abdominally (Figure 3).

Transabdominal ultrasonography for pregnancy evaluation beyond 5 months is possible and highly accurate but requires shaving a large area of the abdominal wall to allow better visualisation because the fetus is very deep in the abdomen.

Ultrasonography offers the veterinarian the clinical means not only to establish a diagnosis of pregnancy but also evaluate normalcy of the pregnancy with respect of cervical tone, placental health, fetal well-being and fetal number (twins).



Figure 1: Transrectal ultrasound of a normal 12 day pregnancy in an alpaca. Arrows point to the amniotic sac (embryonic fluid is black).

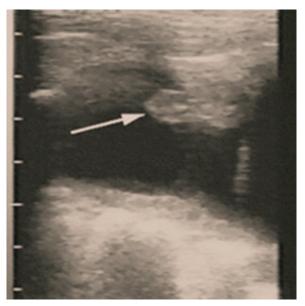


Figure 2: Transabdominal ultrasound of a normal 45 day pregnancy in an alpaca. Arrow point to the fetus (grey) within the uterus surrounded by normal fetal fluid (black).

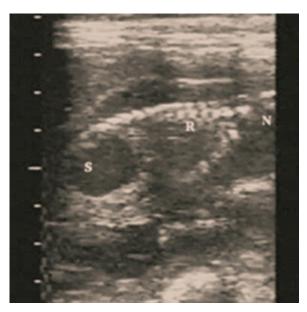


Figure 3: Transabdominal ultrasound of a normal 3 month pregnancy in an alpaca (S= fetal stomach, R= fetal rib cage, N= fetal neck).

Placental health is generally appreciated by looking at the attachment between the maternal side (uterine lining) and the fetal side (fetal membrane; placenta, chorioallantoic). Fetal well being is determined by its growth in relation to gestation stage (using formulas correlating body measurements with age in days) as well as its activity (movements) and its heart rate and rhythm. In addition the appearance of fetal fluid on ultrasound can be used to detect changes that may result in loss of a pregnancy.

Although very highly suggestive of pregnancy, specific behaviour towards the male (spitting-off) is only about 85% accurate in terms of determining pregnancy status. Many females may reject the male for other reasons and most commonly because they have high progesterone that may be due to presence of luteal structures (tissue that produces

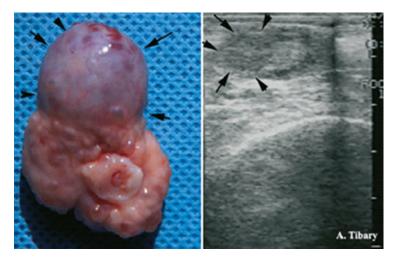


Figure 4: Corpus luteum appearance on a specimen (right) and on ultrasound (left).

The most common hormonal assay that is used for determination of pregnancy status is progesterone. Scientific studies have shown that in order for a female to maintain pregnancy the hormone progesterone which is secreted by the corpus luteum (CL) (Figure 4) should remain high.

The corpus luteum will be the sole source of this hormone and therefore any disruption of its activity may result in loss of pregnancy. But how high is high when progesterone is considered for pregnancy diagnosis? Most labs suggest that pregnancy is only guaranteed if the level of serum progesterone is at or above 2ng/ml. Others prefer to use a cutoff of 1.5ng/ml.

Our ongoing research suggests that there are several sources of variation concerning progesterone levels in pregnant alpacas and it is not rare in our practice to see pregnant alpacas with values between 0.9 and 1.5ng/ml.

Where do these variation come from?

Certainly some are due to sample handling errors, lab errors, but of most importance to us are other factors intrinsic to the female itself. In addition to these variations that make progesterone use for pregnancy diagnosis not reliable there is an added factor which the presence of progesterone in non-pregnant females with persistent luteal structures on the ovaries (persistent CL or luteinized follicles). In fact presence of significant levels of progesterone in the blood should be considered only as a first step in pregnancy diagnosis and the status should be confirmed by ultrasonography.

There are other hormones (estrone sulfate, relaxin) that are used in the later part of gestation to evaluate the fetus and pregnancy however these are rarely used in common practice.

DIAGNOSIS OF PREGNANCY LOSSES IN ALPACAS

As stated above, determining that there was indeed a pregnancy loss will primarily be based on establishing with certainty that the female was pregnant and is now open or by actually visualizing symptoms that are suggestive of a pregnancy loss in progress.

In many instances pregnancy loss diagnosis is posed when a female that has been diagnosed as pregnant (preferably with ultrasound) fails to develop normal third trimester signs of advanced pregnancy (increased abdominal size; visualization of fetal movement) or even worse she may fail to deliver well past her anticipated due date. In some instances, the presumption that the pregnancy was lost is based on behavioural signs of receptivity to the male after establishment of pregnancy (sitting next a breeding pair or across from a male fence).

The best evidence of pregnancy loss is the presence of abnormal discharge from the vagina or elimination of the fetus and the fetal membranes. Vaginal discharges are generally obvious if the loss occurs after 60 days. Most pregnancy losses before this date are seldom seen because some females will just reabsorb even if they eliminate the fetus and its fluid and the signs will go unnoticed because of the smallness of the conceptus. In cases of suspicion of recent loss an inspection of the dung pile may reveal the presence of fetal remnants. The opposite is also possible, owners notice fetal or placental parts on the field, which suggests that a female has lost her pregnancy. In this particular case an inspection of the entire group of females in that pen is warranted.

Pregnancy loss may sometimes be suspected during the process of pregnancy diagnosis. On occasion during pregnancy examination, evidence of disrupted fetal membrane (Figure 5), fetal heart rate, or abnormal ultrasound appearance of uterine content may suggest a non-viable pregnancy.

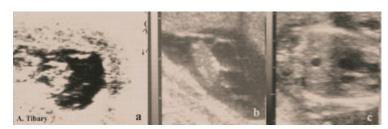


Figure 5: Ultrasonographic appearance of non-viable pregnancies. a) 30 days, note disrupted fetal membranes, b) 45 days and c) 3 months, no fetal fluid, no heart beat.

CAUSES OF PREGNANCY LOSSES IN ALPACAS

Just like any other species, causes of pregnancy loss in alpacas are numerous (Table 1). Pregnancy loss can generally be categorised as sporadic (happening every once in a while and concern only a few females without real association) or epidemic (a 'storm', several females losing pregnancy within a short interval of time). Sporadic pregnancy losses are generally due to factors within the individual itself.

| CATECODY | CALIGE | MOSTILVELV |
|--------------------------------|--|---|
| CATEGORY | CAUSE | MOST LIKELY GROUP AFFETED |
| Sporadic Pregnancy Losses | Severe systemic diseases | All |
| | Severe nutritional deficiencies | Lactating females. Young maiden females |
| | Stress, heat stress | All groups; may be epidemic if several females are involved |
| | Progesterone insufficiency | Some females |
| | Selenium deficiency | All |
| | Vitamin A | Young females |
| | lodine deficiency | Young females |
| | Placental insufficiency | Older females or females with history of uterine infection |
| | Cervical incompetence | Females with history of dystocia |
| | Metabolic problems (hepatic lipidosis) | Obese females |
| Sporadic Drug Induced | Prostaglandin injections | All, any stage of pregnancy |
| | Corticosteroids | All, any stage of pregnancy |
| | 8 way vaccines | Some females may react to this |
| Infectious Pregnancy Losses | Chlamydiosis | May cause abortion storms |
| | Toxoplasmosis | May cause abortion storms |
| | Leptospirosis | May cause abortion storms |
| | Brucellosis | Not present in the USA |
| | Bacterial placentitis | Females with bad vulvar conformation or recurrent vaginal prolapse during pregnancy |

| CATEGORY | CAUSE | MOST LIKELY GROUP AFFETED |
|----------|----------------------------|-----------------------------------|
| Genetics | Twinning | Some Females |
| | Severe fetal malformations | Rare |
| | Fibre production | High producing fine fibre animals |

An example of sporadic pregnancy loss is the female that mistakenly receives a drug that causes loss of corpus luteum function (Table 1), or has undergone a stressful situation resulting in her losing the pregnancy (ie severe disease process, long stressful trip, heat stress). Probably the most common sporadic form of pregnancy loss is illustrated by females that tend to become pregnant relatively easily and then lose the pregnancy within a few weeks or cannot carry the pregnancy to term due to placental insufficiency, hormonal imbalances or genetic predisposition.

Placental insufficiency is due to a lack of normal placental development resulting from the presence of scarred uterine tissue or premature placental separation. Hormonal imbalances may be brought about by stressful conditions. Progesterone deficiency is suspected in many females but is hard to isolate as a primary cause of pregnancy loss.

Infectious causes of pregnancy losses are of special interest to large herds or herds that have no biosecurity measures. The most commonly diagnosed infectious causes of pregnancy losses are leptospirosis, chlamydiosis, and toxoplasmosis. These diseases may cause severe losses if they happen in an epidemic fashion.

Diagnosis of the exact cause of pregnancy loss is generally very frustrating and requires investment in time and cost of laboratory procedures.

The best chance of determining the cause of pregnancy loss in the case of an observed abortion or stillbirth is to provide the veterinarian with all the tissues for laboratory submission immediately. These should include the fetus and placenta (Figure 6). These tissues should be removed and secured in plastic bags and rushed to a veterinarian in a fresh condition or cooled (not frozen).

In addition, the veterinarian may opt to take uterine culture and blood samples from the aborting female(s). Obtaining these samples in good condition within the first 24 to 72 hours after abortion greatly improves the diagnosis of the cause of pregnancy loss. In some cases the veterinarian may suggest taking blood samples from other females in the herd for comparison purposes. Always take abortion seriously because it could be just the beginning of an abortion storm.

The placenta is a mirror image of the uterine lining and should be kept fresh for evaluation by a veterinarian (Figure 7). The placenta will be examined by the veterinarian for any signs of inflammation (placentitis) or infection that may be involved in the abortion or still birth (Figure 8).

The surface of the placenta will also provide information on possible areas of scarring (fibrosis) which will lack the typical arrangement of tissue (villosities of the microcotyledons) responsible for the transfer of nutrient between the dam and the fetus. Samples from the placenta will be taken for microscopic evaluation (histopathology).

APPROACH TO DIAGNOSIS OF THE CAUSE OF PREGNANCY LOSSES IN ALPACA



Figure 6: Abortion, 6 month-old fetus and placenta from a female that aborted due to severe trace minerals deficiency.



Figure 7: Alpaca placenta showing lesions on the surface.



Figure 8: Placentitis. Thickened placenta seen by ultrasonography. This female aborted 4 days later.

The fetus is usually examined for malformations, growth retardation or evidence of infectious agents. Growth retardation is determined by measurement of the size of the fetus and comparing it to normal growth charts. Samples taken from the stomach of the fetus will be taken for bacteriological examination.

The female(s) experiencing pregnancy loss at any stage of pregnancy should be isolated from the rest of the herd and examined thoroughly. The initial examination generally focuses on detection of any systemic diseases or nutritional problems that may be responsible for or a contributing factor to pregnancy loss. Females in poor body condition or suffering from mineral deficiencies experience a higher rate of pregnancy attrition, abortion and stillbirth.

Young females that are bred before they have reached at least 65% of the expected adult weight and size will experience a higher rate of abortion or early pregnancy loss. Data from South America showed that females that are bred before they reach 90lbs in weight experience pregnancy loss at a rate of 40–60%. In North America, because of a higher level of care and nutrition young females may reach and surpass this weight before they are sufficiency developed (uterus and bone structure) to be able to maintain a pregnancy.

Progesterone insufficiency is without doubt the most commonly 'diagnosed' and 'treated' disorder by several breeders and veterinarians

Progesterone insufficiency is without doubt the most commonly 'diagnosed' and 'treated' disorder by several breeders and veterinarians. What do we know about progesterone deficiency? Although this is a likely cause of pregnancy loss in alpacas, it is very hard to determine

whether progesterone decline is a result of embryonic death or that the embryo dies because of lack of progesterone. Many articles stipulate that the minimum level of progesterone in blood required for maintenance of pregnancy is 2ng/ml. However, results in an experiment in progress in our laboratory shows that many normal pregnant alpacas have progesterone concentration as low as 1.2ng/ml. Reports from field observations indicate progesterone values as little as 0.6 ng/ml in alpacas that carried to term.

These results point to a serious problem in that many alpacas may be supplemented with progesterone when they do not need it and that there may be some errors in reported progesterone values. It is my clinical opinion that progesterone should be >1ng/ml for a pregnancy to be maintained. Low progesterone values reported in pregnant alpacas may be due to sample handling or to laboratory errors. Other factors affecting progesterone values, due to the individual female, are being investigated currently in our laboratory.

Pregnancy loss may also occur in alpacas due to stressful conditions (heat stress, re-adjustment to a new environment ...). These situations generally remain hypothetical and their diagnosis will be based on historical data (was there a change in management or handling in the days preceding pregnancy loss?). Another form of 'stress' that I suspect may cause midterm to late-term abortion in alpacas is the competition between fibre production and fetal growth.

Treatment with corticoisteroids (even topical eye ointment), some eight way vaccines and administration of the drug prostaglandin F2 alpha or its analogues (normally used for treatment of retained CL's) will cause abortion.

Repeated pregnancy loss between 30 days and 8 months due to twins has been reported to me on several females. Double ovulations and twin pregnancies are not rare in alpacas. There seems to be an increase in these twinnings probably because of increased nutritional plan and improvement in our ability to detect the twins by ultrasonography. This is an added benefit of using ultrasound for pregnancy diagnosis rather that just progesterone levels or behavioural manifestations.

Late twin abortion will cause excessive time loss and added hardship for the aborting female with increased dystocia and postpartum complications which may jeopardize the future reproductive life of the dam. Therefore early diagnosis of twin ovulations and twins is highly recommended particularly in those females that have had already an incidence of twin pregnancy. Many alpacas that start their pregnancy as twins will reduce to a singleton and will go on to have a normal pregnancy to term. I recommend that any female that has not reduced the number of fetuses on her own by day 35 of pregnancy be aborted at this stage.

PREVENTION OF PREGNANCY LOSSES IN ALPACAS

Prevention of pregnancy losses in alpacas requires several measures at the herd level and at the individual level.

At the herd level, prevention of outbreaks of losses requires development, with the attending veterinarian, of strict and detailed biosecurity measures as well as a good herd health (proper regular deworming and vaccination) and nutritional (regular evaluation of feed quality, trace mineral levels and body condition of animals) programmes. Vaccination against some of the abortion causing diseases such as Chlamydiosis and leptospirosis may be indicated in high risk situations. Genetic selection programmes may be involved in overall reproductive performance in alpacas and should always be kept in mind.

On an individual level, high risk pregnancies or female at high risk of losing their pregnancy after breeding should be identified early. This group should include any female that has had a history of pregnancy loss, obstetrical problems or uterine infections. All these condition can lead, if not treated properly, to uterine fibrosis (scarring) which will not be compatible with normal placental function and result in early fetal loss or abortion. Uterine biopsy may be indicated in some females in order to determine if they have these chronic changes in the uterus.

The best way to prevent pregnancy loss and maximise the reproductive career of a female alpaca is to adopt strict measure in the prevention of uterine infections and birthing problems which are responsible for development of these chronic changes. Uterine infections are best prevented by avoiding repeated unnecessary breeding. If uterine infection occurs they should be promptly and adequately treated. Obstetrical manipulations should be done by a knowledgeable person observing strict hygiene measures.

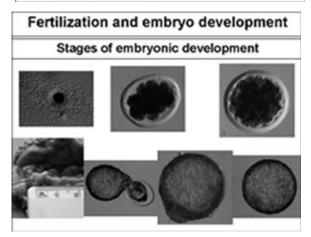
High risk females should be monitored closely during pregnancy. If progesterone supplementation is the option taken, fetal viability and well being should be verified regularly to avoid maintaining a dead fetuses in the uterus. Several types of progestogens (progesterone or progesterone like hormones) are available on the market. Although, anecdotal success with some of these are reported by breeders and veterinarians there has been no scientific research to demonstrate their efficacy in prevention of pregnancy loss nor the manner by which they should be used. Sexual rest of older female or females with uterine fibrosis for a few months may improve their chances in carrying to term.

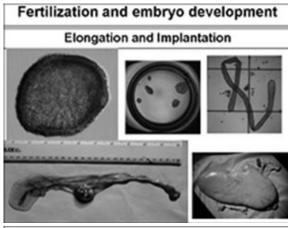
In conclusion, pregnancy loss in alpacas is relatively common particularly in populations at high risk (older females, maiden underdeveloped females, females with a history of uterine infection or obstetrical problems). Management measures to reduce the incidence of these problems and 'prepare' females for breeding is the first step in prevention of losses.

The use of ultrasonography is recommended for early pregnancy diagnosis and monitoring of pregnancy. Abortions can be due to infectious diseases and each should be taken seriously, working with the veterinarian immediately after noticing an abortion. Submitting fetal, placental and dam samples to a laboratory improves the odds of determining the cause.

Fertilization and embryo development

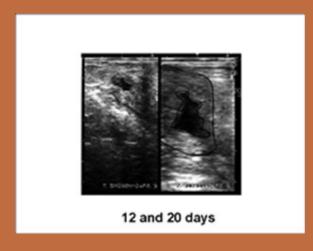
- High fertilization rates (>90%)
- Double and triple ovulations are possible
- Migration into the uterus depend on fertilization and stage
- Hatching occurs during migration from the uterine tube to the uterus
- Implantation
- Fetal development

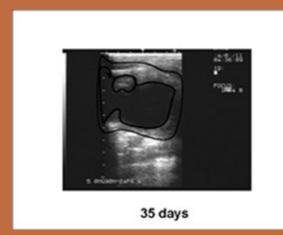


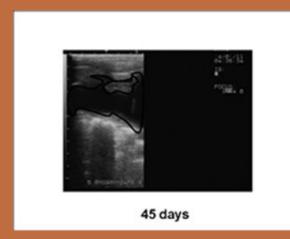


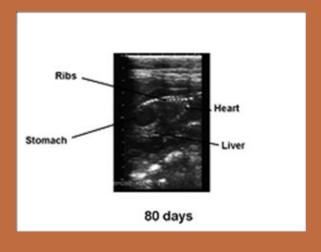


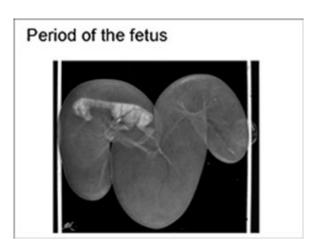
12 to 18 days











Acknowledgement

I am indebted to several colleagues as well as breeders from all over the USA and particularly WA, ID, OR, CA, CO and MT, who share with me their clinical observations and entrust me with care for their alpacas.



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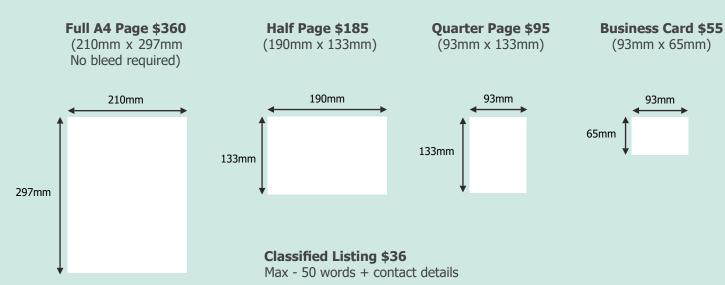
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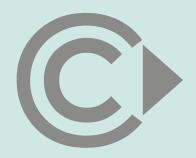


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