

ALPACAS AUSTRALIA

The official publication of the Australian Alpaca Association Inc.

ISSUE 52 • AUTUMN 2007



Inside this issue:

Australian World Alpaca Conference 2008 • Australian Ultrafine Bale • Health and Welfare

HALCYON ALPACA STUD



★ Celebrating Ten Years

This year we celebrate a successful 10 years of alpaca breeding. During this time the Australian industry has changed and evolved into a strong force in alpaca genetics and fibre.

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www.halcyonalpacas.com.au

New Web Site



COVER
Photograph by
Ben Simpson
at Halcyon
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A Message from the President

By the time the pages of this magazine are opened to the light of day, the long running issue of the conversion of our Association to a company limited by guarantee will have been resolved by special resolution at the Melbourne OGM of March 25th. That will be something of a relief to those whose task it has been to pilot the process, and whose time and energy have been given exhaustively over the past several years to bring the process to a conclusion. Their patience and perseverance has been superhuman. Whatever the outcome, the Association remains forever indebted to them.

All of which is not to presume the outcome, which can be determined only by the vote of the members. Whilst hitherto proscribed by legal advice from providing the leadership which I felt my role demanded, with the process now concluded I am no longer so constrained. It is my personal opinion that the existing structure of an Association incorporated under the Victorian legislation has served us well, but cannot reasonably continue to do so for the foreseeable future. A change to CLBG will ensure that we are structurally prepared for the management and policy initiatives that will ensure the prosperity of the industry well into the future.

Chief amongst these is the need for the Association to create income beyond its membership. We need to attract funding from governments, agencies and through commercial contracts, in order to limit that proportion of our budget which is funded directly by members, through their subscriptions and purchase of services. Not far behind that priority is the need to limit our expenditure. The extraordinary sum of \$270,000 has been spent on legal advice since December 2003, much of it to clarify the obligations, risk exposure, and governance of the Association, but a substantial part of it in defending legal actions brought against the Association by its own members. Such expenditure is very much a cost of doing business these days, but it is to be expected that, with conversion to a CLBG, there will be a greatly reduced demand for that legal advice and the rewritten rules and constitution will render our organisation less vulnerable to vexatious litigation.

It is reasonable to suggest that no gathering of two or more people, irrespective of their common interests, can reasonably be expected to share the same point of view on all matters. Disagreement and debate are facts of life. How individuals manage conflict says much about their personalities. Our membership says it has to be handled better. Damaging public rhetoric, personal vilification, and law suits are unacceptable. Reasoned discussion, professional mediation, written entreaties, and ultimately elections, are all fair and reasonable tools in conflict resolution. Our membership demands that we pursue methods of conflict resolution that are more constructive, cheaper, and less damaging than those employed to date. And members should accept, as a starting point in any conflict, that whilst their elected representatives may not always make the correct decisions, they are acting

with diligence, honesty and selflessness in pursuing any agenda on behalf of the Association and its members. To assume less is truly vexatious.

In August, 2006, I stood for the Presidency of the AAA in the context of several running disputes between the AAA and a few of its members. Amongst other things, my nomination statement declared:

For at least one year, the AAA has been under siege by a small number of aggrieved members, whose concerns – some legitimate, some less so – have consumed the resources of the paid staff and elected representatives of the Association to the point where the progress of the Association has slowed to a crawl. I stand for the office of President to address that situation. The resources, in time and dollars, of our association are limited, and they must not be consumed in the exclusive service of one small part of the membership. Legitimate concerns must be addressed where that is to the benefit of the general membership; but endless carping criticism must not be allowed to consume our resources and divert our energy from the business of progressing the industry. A vote for my Presidency endorses that view, and is a mandate to act upon it.

The membership voted three to one, in record numbers, to endorse that point of view.

I am hopeful that, as you read this, we are empowered by passage of the Special Resolution to incorporate our Association under Federal legislation as a CLBG. If that is so, our Association may look forward to "getting on with business." If not, I fear we face more of the same, and I harbour grave reservations about the ability of the AAA to maintain its forward momentum in industry development, whilst still attending to internal disruption. My election would suggest most members share that perception. I have no intention of spending my term in NatCom dispensing members' funds to lawyers: I share little with those who commit us to that course, and the membership has strongly endorsed that view.

It is, nevertheless, my expectation that the membership will have voted in favour of a CLBG. In that event, I take this opportunity to congratulate them, and indicate my very strong belief that that new structure will enable our organisation to progress inexorably in standing and strength over the coming years.

Your National Committee is committed to that task. The World Alpaca Conference, which we are planning for 2008 (and about which you may read elsewhere in this magazine), is a major initiative in that direction, and I warmly commend it to all Australian and overseas alpaca breeders as a landmark event in the history of the global alpaca industry. ■

Dr Ian Davison, President

Briefly Speaking

14th AAA Inc. National Show and Sale

19 - 21 October 2007
Exhibition Pavilion, Royal
Melbourne Showgrounds

The new pavilion is an impressive 10,000 sq. metre purpose-built animal exhibition space affording ample room for animals and handlers, spectators, and displays of the exhibits in the Fleece, Craft and Art/Photography sections.

So... set aside your best fleeces and select your show animals or get started on that unique alpaca craft item or an entry for the Art/Photography competition. There's something for everyone so don't miss this exciting annual event!

Sponsorship and trade display enquiries are welcome now by contacting the Show Convenor, Geoff Hargreaves Tel: 03 5773 2494 or e-mail: pachacuti@bigpond.com

"Shear Delight - Sharing the World of Alpacas"



Introducing the first
World Alpaca Conference

Cockle Bay, Darling Harbour,
Sydney, Australia
28-30 March 2008

Read more on page 4.

www.alpaca.asn.au

Check out the new look web site!

A vital source of information on alpaca events, alpacas for sale and latest industry news.

Genetics Research News

As reported in *Alpacas Australia*, December 2006 issue by Dr Christopher Stewardson, Tolendal Alpacas, Victoria and General Manager, Faculty of Science, University of Melbourne, the Department of Genetics at the University of Melbourne has obtained an Australian Research Council grant for a project entitled *Breeding for the Future - Alpaca Genetics*.

Alpacas Australia hoped to bring more news on the research in this issue however Dr Stewardson has advised that more comprehensive information will be made available for publication in the August 2007 issue.

Have you moved?

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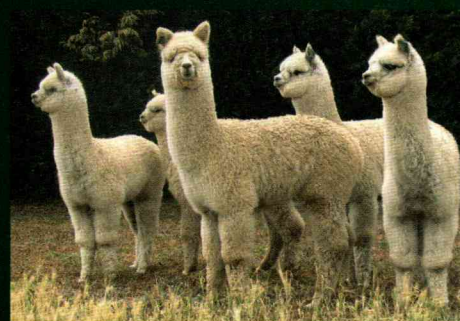
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"Shear Delight"

Sharing the World of Alpacas

by **Heather Vickery** > Convenor, World Alpaca Conference 2008

Foreword:

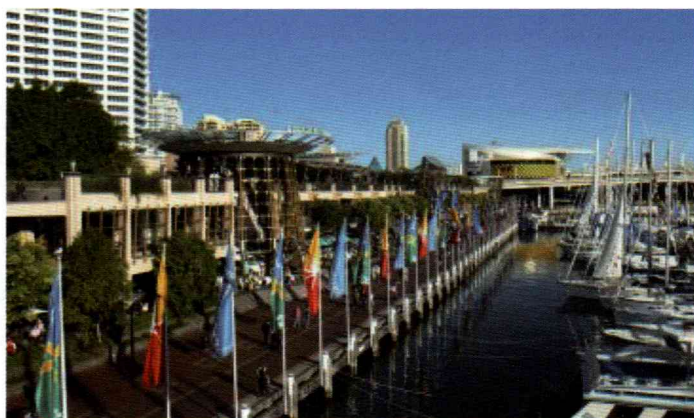
Dear Australian alpaca breeders,

It is with great delight that I commend to you the ground-breaking event that Heather Vickery has conceived for our industry, following the Sydney Royal Easter Show in 2008. Our biennial National AAA Conference is to be offered for the very first time as an international event; the first World Alpaca Conference, attracting delegates and speakers from all over the world. Whilst showcasing the Australian alpaca industry to the world, it will also bring to Australia the latest in alpaca news, technology, research and information from the four corners of the globe. It will be a social, educational, networking and festive event which you will count amongst your best holidays, whilst still appeasing the tax man! I urge you to bookmark the date now and ensure your place at this historic event, the most ambitious ever undertaken by the Australian alpaca industry.

*Dr Ian Davison, President,
Australian Alpaca Association Inc.*



Introducing the first
WORLD ALPACA CONFERENCE
Cockle Bay, Darling Harbour
Sydney, Australia
28 - 30 March 2008



docksider

To celebrate the 20th year of alpacas in Australia, the Australian Alpaca Association Inc. will be holding the first World Alpaca Conference at Darling Harbour in Sydney. The venue, Docksider at Cockle Bay on the foreshores of Sydney Harbour, has been selected for its attraction to overseas and interstate delegates.

Come and witness for the very first time a conference which we envisage being 'The Greatest Show on Earth' in the world of alpacas.

The World Alpaca Conference will be held on 28-30 March 2008 following on from the Sydney Royal Show, providing an opportunity for overseas and local delegates to enjoy a week of festivities.

AAA Inc. President, Ian Davison has invited presidents of alpaca organizations from around the world to attend and speak on behalf of their respective countries on their progress in alpaca breeding.

In a world first in open forum discussion on alpacas, noted speakers, both international and Australian, will also speak in sessions throughout the weekend providing conference delegates with a unique opportunity to glean valuable information.

Farm visits will be arranged during the week preceding the Conference as well as a Harbour Cruise luncheon. A travel agent has been appointed to cater for accommodation and sightseeing needs.

This international first, held by us in beautiful Sydney Harbour, has already attracted worldwide interest and is anticipated to be well attended. Excellent accommodation is available within easy walking distance of the venue and will cater for all tariff levels.

Various sponsorship opportunities and trade space will be available at Dockside throughout the three days and we invite interested parties to contact me at:

heather.vickery@bigpond.com or Jenny Jones at the AAA National Office *jenny@alpaca.asn.au*

The conference will commence on Friday with a day devoted to showcasing fleeces, both Australian and others from around the world, which will be the topic of discussion by a panel of judges and fleece experts during the day giving an insight into the industry worldwide. Conference registration and a cocktail party will be held overlooking the harbour in the evening. Saturday and Sunday will feature presentations by speakers from around the world and on Saturday night our dinner dance will feature a fashion parade of alpaca garments from all corners of the globe.

This exciting conference is quickly taking shape. We, as a committee made up of members from around Australia, are working hand in hand with AAA and our President, Ian Davison to ensure the success of this event, and invite you as alpaca breeders to attend and listen and take part in 'sharing the world of alpacas'. ■

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Royal Alpaca (under 19 micron)... *Here We Come!*

FLEECE ARTICLE by **Michael Talbot** > Managing Director, AAFL

A push by the Australian alpaca industry to secure a greater share of the top-end apparel market has been given a boost recently with the successful production of the nation's first 'Ultrafine Alpaca' bale. The bale, with an average fibre diameter of 17.9 microns and weighing 93 kilos, was achieved by sourcing some of the finest pure white alpaca fleeces from around Australia. A second 'Superfine' bale also weighing 93 kilos, achieved an average of 19.6 microns.

The ultrafine bale scheme was carried out under the brand name of **Alpaca Ultimate**, a commercial vehicle for growers to consign premium alpaca fleece, in conjunction with Australian Alpaca Fleece Ltd.

Chairman and founder of Alpaca Ultimate, Mr Paul Vallely, who is also the owner of Australian Alpaca Fibre Testing, developed the ultrafine bale concept after listening to speakers at the 2006 National Alpaca Fibre Seminar and contacted me to secure interest in regard to marketing this product.

Together with alpaca breeders, John and Penny Pittard, Julie and Peter McClen and Marilyn Matthews, plus a dedicated group of interested fleece-minded growers, the ultrafine bale was created.

Mr Vallely said this ultrafine bale was a perfect example of how Alpaca Ultimate could extend the market reach for alpaca fibre through its strategies of quality control, 'demand driven' fleece preparation, brand recognition and grower feedback.

"It became clear that alpaca breeders needed to tap into premium markets in order to cover the costs of producing quality fleeces. The criteria set for these fleeces allow the bales to be blended with superfine wool and made into the finest quality fabrics for the top-end fashion market," Mr Vallely said. "It is possible with bales such as these, to look at a whole new arena of product ranges for alpaca fibre, particularly in the overseas markets."



Mr Paul Vallely

Mr Vallely said that in order to meet the exact demands of the top-end textile market, strict specifications were placed on procedures and criteria for selecting and preparation of fleeces for inclusion in the bales.

Initially, an evaluation was conducted to determine the key price drivers for the premium fibre market. These drivers would set the selection criteria for the bales.

Four major buyers of superfine wool and three buyers/processors of fine alpaca fibre were consulted. Further, reference was made to reports published by the CSIRO that related to the relationship of raw fibre traits with top-end processing performance.

As a result of the evaluation, it was decided to compile one bale with as low an average fibre diameter as possible, and a second bale with average diameter below 20 microns. Both bales would need to weigh more than 90 kilos. The bales would be required to have extremely low levels of coarse fibres and be no more than 100mm staple length in order to blend with ultrafine and superfine wool.

The evaluation showed a clear preference for pure white fibre for this particular market. Finally, content of vegetable matter was to be no more than 1.5% and, needless to say, fleeces were to be absolutely free of contamination such as twine, metal, plastic etc.

Breeders throughout Australia then submitted mid-side samples that were subsequently tested by Australian Alpaca Fibre Testing (AAFT). To pass the initial screening, samples had to test below 19 microns, have staple length between 75mm and 100mm, have no greater than 1% of fibres testing above 30 microns and be pure white.

If the fleece samples passed the initial test, the grower sent the fleece/s to the AAFT depot in Crookwell, NSW for further screening and grid sample testing. This procedure confirmed the fleece/s met the selection criteria, were contaminant free and that coarse fibres were removed. The completed bales were then core sampled and tested by the Australian Wool Testing Authority. Following the core testing, all participating growers received the first feedback sheets containing information and advice arising from the fleece classing and testing phases.

Mr Vallely said that after compiling the bales, an evaluation of the two testing phases was conducted, particularly with regard to the relationship between mid-side test results and fleece grid sampling results. The evaluation revealed the mid-side results were between 1 micron and 3 microns finer than the averages from the respective grid tests. He said the relationship between mid-side test results and the grid test became even cloudier when some breeders submitted mid-side results from testing contractors who failed to clean samples before testing. This resulted in the difference being increased by a further 1 to 2 microns.

"In these cases, the mid-side test was irrelevant when estimating the overall fleece average," Mr Vallely said.

In future, all mid-side testing for this exercise will be carried out by AAFT.

"We would like to see over half a tonne of ultrafine bales produced per year in order to secure volume orders for the fibre. The emphasis, however, will also be upon gaining the confidence of markets by producing quality controlled consignments of fleeces with low variation of fibre traits and on a consistent basis," said Mr Vallely.

Mr Vallely commented that while this initiative is part of a drive to capitalize on existing markets, the Alpaca Ultimate concept could be extended to develop demand for coloured and suri fleeces.

The bales have now been delivered to Australian Alpaca Fleece Limited to be marketed on the world stage.

An update on the ultrafine bales as well as presentations on the use of breeding programs aimed at premium fleece production will be on the agenda at the 2007 National Alpaca Fibre Seminar to be held at Ballarat in July.

Excitingly, whilst only small in volume at this stage, we now have a product that can interest fine wool spinners around the world. Due to the R&D required to get this exercise started the returns will not be there at the beginning, however long term we are hoping this will set the stage for lots of "Royal Alpaca", as the Peruvians call it, to come out of Australia and really tackle this premium market that they have had on their own in the past.

The bale will be on display in our warehouse at Sunshine, Victoria and is being carefully covered to ensure no contamination. We are using this to promote the success of the Alpaca industry in Australia with the promise of much more to come.

On behalf of AAFL, I would like to congratulate the participants in this initiative and especially their interest in the fleece industry, which is vital to the success of the whole alpaca industry. ■



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Is Your Alpaca Quidding?

ANIMAL HEALTH & WELFARE ARTICLE by **Allison Quagliani** > Alpaca Dental Services, VIC

Quidding is the carrying of a cud or quid of grass or hay in the mouth. Alpacas with overgrown or very sharp molars use this ball of food to protect their cheeks and gums from the pain incurred while chewing their food.

The quid is not swallowed and if you are very observant you may find them on the ground in the area where the alpacas live. From the outside an animal with this protective pad in its mouth looks like it has a swelling, often the size of a golf ball on the side of its jaw.

The alpaca in Figure 1 had a much larger, very obvious swelling. Quidding is usually accompanied by other symptoms that indicate severe dental malocclusions and animals should be treated as soon as practicable to restore correct mouth function and ultimately good health.

The meeting of the lower teeth with the upper teeth and dental pad is called occlusion. If for some reason they don't meet together correctly it is called malocclusion. Teeth continue to erupt for most of an alpaca's life at the rate at which they are worn. If a tooth is not wearing against another tooth it will become protuberant, meaning to stick out above the surface of the others.



Figure 1. Petunia's 'swelling' on the side of her jaw.

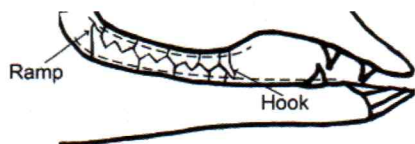


Figure 2. Hook and ramp shown digging into gums (dotted line).

Other terms used to describe types of malocclusions are ramps, hooks (Figure 2) and wavy mouth. Wavy mouth is the uneven wearing of the cheek teeth creating a 'roller coaster' effect on the grinding surface of the teeth.

In my work as an Alpaca Dentist I come across a variety of cases of varying severity. Below I will discuss three case studies of animals I have successfully treated during the last 16 months. All three were found to have severe dental malocclusions.

Petunia

Petunia is a nine year old female who was brought to my attention during November 2006. At that time she was in her ninth month of gestation and had been examined by a vet to treat a large swelling on the side of her face (Figure 1). The 'swelling' turned out to be a small football-sized collection of food that was packed between her teeth and her cheeks! Petunia was referred on to me by the vet, who suspected a tooth problem.

She presented with a low body condition score, a generally unhappy demeanour and she had a constant stream of frothy green dribble running out of her mouth. I removed several large handfuls of partly chewed, matted grass from inside her mouth

Petunia did have serious teeth problems. Her molars were all wearing unevenly creating a wave mouth. Two of the lower molars at the back of her mouth had become so long (ramps) the opposing upper teeth were worn down below gum level. Every time she chewed her teeth were digging into her gums and the outside edges of her upper molars were cutting her cheeks. Imagine the pain! Her only defence mechanism against this was to use the quid or grass ball as a buffer between the sharp teeth and the sensitive parts of her gums and cheek.

Petunia sat patiently while I worked on her teeth to file down the longer molars and remove all the sharp edges. Doing this removed the pain she felt while chewing and gave her a much more efficiently functioning mouth.

In the following two and a half weeks Petunia gained a mighty 5.6kg and has since given birth to a healthy cria. The collecting of food in her mouth did not stop immediately, it took a couple of months, partly because it had become habit and partly because she didn't realise she no longer needed the protection it was providing.

Prince

I treated Prince, a rather special stud male in March 2006. At twelve years old he had a low body condition score, was storing balls of food at the back of his mouth on both sides and had dribbled so much he had dermatitis on his lips. He was spending more time than the others sitting around and had also lost interest in the girls.

Prince had dagger-like ramps on his rear molars and hooks on his upper premolars (Figure 2). The ramps were long enough to penetrate the opposing gum. The pain was preventing him from eating enough to maintain his weight.

I provided the necessary treatment and he soon gained weight, stopped dribbling and collecting food in his mouth and importantly, has cria due later this year.

Rocky

I treated Rocky during winter. This eight year old wether had become very grumpy and started spitting. This was not his normal attitude. He was on good feed but not able to maintain body condition as well as his companions. His other symptom was a swelling slightly larger than a golf ball on one side of his face. His owner had noticed these symptoms and gave me a call after attending one of my presentations.

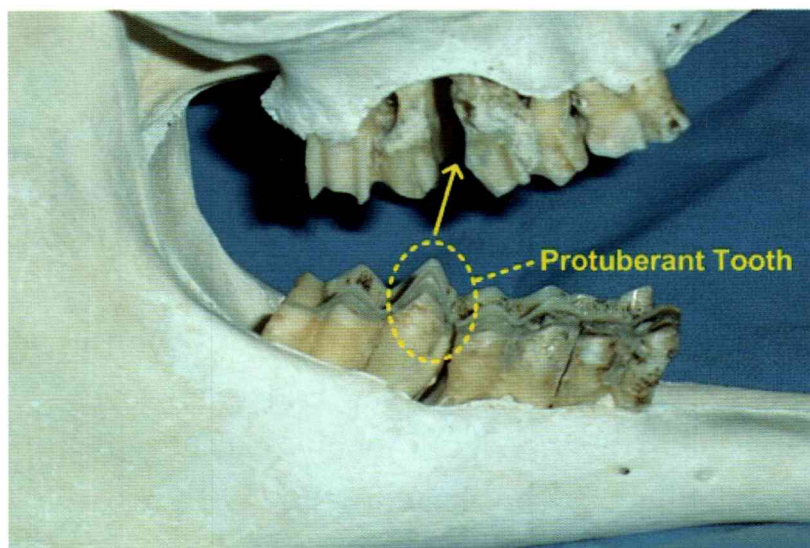


Figure 3. A skull showing the damage a protuberant tooth can do. The tooth on the lower jaw has forced itself between two of the top teeth. Note the damage to the bone.

Two of his molars were more than 12mm protuberant, digging into his gums (Figures 3&4)). These teeth were trimmed removing any pain associated with chewing. He was back to his normal, happy, easygoing self within a few days.

Summary

These three alpacas and many others that I have treated usually displayed some common symptoms:

- > Struggling to maintain bodyweight
- > Unhappy demeanor
- > Dribbling
- > A reluctance to eat accompanied by obvious pain on chewing
- > Swelling around the jaw area

The majority of these animals tend to be in the eight to twelve years old age group. Females with problems are often identified when nutritional demands are high during later pregnancy and lactation.

Dental malocclusions do not appear overnight and take years to develop to the advanced stage of the above case studies. Watch closely how your animals eat and monitor body condition regularly. As with all health issues, the earlier dental problems are diagnosed the easier the treatment and of course the amount of stress and suffering to the alpaca is greatly reduced. ■

Further Reading

Dental Malocclusions in Australian Alpacas by Allison Quagliani, AAA Conference Proceedings, 2006

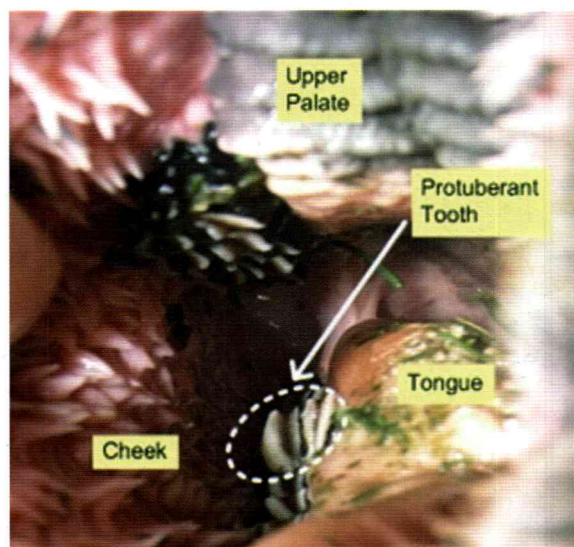


Figure 4. An inside view of Rocky's mouth, showing the protuberant tooth.

New AAFL Retail Factory Outlet Promoting the Latest Alpaca Products

FASHION ARTICLE by **Michael Talbot** > Managing Director, AAFL



With our introduction into the wholesale business with the launch of Australian Alpaca Connection, many of these products have been coming in and out of the warehouse and, in the past, have not been readily available to be either viewed or purchased by growers visiting our warehouse in Sunshine, Victoria.

To try to address this problem and also attract new sales, especially from the tourist market, we decided to open a factory shop where we can promote the latest releases in homeware and fashion, displaying all the products that we

produce plus products from our strategic partners.

All merchandise in the shop is available to be purchased by all growers and members of the general public, with a 15% discount off retail price for all alpaca growers.

It is our ultimate intention to have this shop open Monday to Friday, however initially we will probably restrict opening times to Thursday and Friday to test the level of demand. Please feel free to come and see our latest designs. ■

Governor's Cup Win by Banksia Park Alpaca Stud

A First for Alpaca Industry

INDUSTRY ARTICLE by **Ron Raynor** > Regional Marketing Representative, WA Central Region

Jenny and George Jackson from Banksia Park Alpaca Stud in Western Australia had an historic win for their stud and the alpaca industry in being named joint winners of the prestigious Governor's Cup at the 2006 Perth Royal Show.

The Governor's Cup has been competed for at Perth Royal Shows since 1896. The object of the award is to encourage exhibitors to compete with the highest quality pedigree breeding exhibits and rewards both excellence and consistency throughout the whole range of their exhibits. Points can be gained for first, second and third prize winners from all single pen classes, excluding group and special classes. Points are not awarded for Championship or Reserve Championship wins.

All up, Banksia Park won 9 first places, 6 seconds, 5 third placings, 4 Championships and 3 Reserve Championships in the Huacaya section of the 2006 Perth Royal Show. In the Governor's Cup only the ten most successful single pen entries for each exhibitor contribute to the calculation and it is believed that Banksia Park would have accumulated 37 points from the best ten of their twenty placings in the various classes.

It is unfortunate that due to a clerical error in calculating the results from the various livestock sections, the win by Banksia Park was not discovered until a post audit of the points. The Cup was initially awarded to cattle farmers, Loreen and Tony Kitchen of Bandeeke Stud, Elgin but they will now share the honour with Jenny and George Jackson. The error denied Jenny and George the honour of participating in the Governor's Cup award presentation which is the highlight of the Grand Parade on the final day of the Royal Show.

Telephone advice of their win was received late at night by Jenny and George while in New Zealand on a show judging visit. Their excitement at winning such a prestigious award was put on hold for a few hours though as their good friend and fellow alpaca breeder, Geoff Fysh is notorious for his practical jokes, so they waited until they could ring the Royal Agricultural Society office in Perth the next morning



Photograph by Mary-Anne Shaddick

Mr Ivan Solomon, President of the Royal Agricultural Society of WA pictured with Jenny Jackson following the presentation of the Governor's Cup

to confirm their success before letting family and friends know about their win.

In her acceptance speech at a special award presentation arranged at the Royal Showgrounds, Jenny acknowledged that it would probably have been easy for the Show Society to not correct the error however they had done so and she was pleased to accept the award on behalf of herself and her family.

Banksia Park was established in 1992 with the initial importation of a few Peruvian alpacas. They have since gone on to establish a herd in excess of 700 alpacas and are among the most successful alpaca breeders in Australia. They are major participants in the growing Embryo Transplant (ET) aspect of the alpaca industry with their ET progeny being sought after throughout Australia and New Zealand. One of their males, *Banksia Park Khan ET* was awarded Supreme Champion at the 2005 AAA Inc. National Show and was later sold for an Australian record price of \$170,000 at the National Auction. Another of their ET progeny, *Banksia Park Miss Penelope ET* won Champion Junior Female Huacaya at the 2006 AAA Inc. National Show and sold for \$64,000 at the following day's National Auction. ■

Canberra on Straw

SHOWING AND JUDGING ARTICLE by **Carolyn Austin** > Royal Canberra Show Convenor

The last five years have been tough for the Central Tablelands of NSW, including the ACT. The ACT had been on strict water restrictions for months and the Show Society had been unable to water the area where we have the alpaca marquee, so it looked like it was going to be a dusty affair for the 2007 Canberra Royal Show.

That was until I started watching the weather forecasts for the week of the show – 'daily thunderstorms' was the warning – if only, we thought.

Well, the weather bureau was fairly well spot on the target, every afternoon before the show the clouds rolled in and to some extent there was rain everyday, slightly settling the dust (the grass had long since died and gone). On the Thursday before the fleece judging the heavens opened and there was significant rain. It flooded the marquee and the tent where the fleeces were to be judged, add to this a temperature of at least 35°C and you can imagine the sub-tropical sauna it created for our poor fleece judges and stewards – still, no one complained – all just happy to finally see some rain.

On the Friday night it rained again, this time it was the animal judging that was to be undertaken next day. With a bit of lateral thinking and some help from exhibitors the entire show ring and marshalling area was covered in straw – it looked very rural and certainly did the job of soaking up the precious rain and turning a mud puddle into a very picturesque setting. It was all a bit of a novelty and I think the animals on the whole enjoyed the new surface.

With well over 260 animal entrants and 160+ fleeces the competition was tight and, given the drought conditions many had come from, the quality of animals was outstanding.

The Supreme Suri was awarded to *Baarrooka Elara* exhibited by Baarrooka Alpacas and the Supreme Huacaya was *Camelot Tor* exhibited by Grand Alpacas. Both breed winners had travelled all the way from Victoria for our big country Royal Show and hopefully they and a number of other southern travellers will feel the trip was worth the effort and will be back again next year to keep us northerners on our toes.

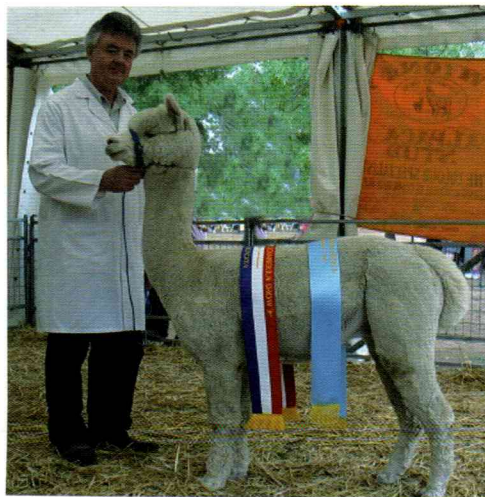
The Champion Huacaya Fleece was awarded to *Belbourie Titan* (at last, a winner from NSW). Unfortunately this year there were insufficient numbers and quality to award a Suri Champion Fleece so I encourage all Suri breeders to save a few fleeces for the Canberra Royal next shearing season.

I would like to thank all the tireless helpers and stewards who assisted me in convening the show and lastly, the fabulous judges we had this year – Dianne Condon judged the animals and Kylie Martin the fleeces. We were also very pleased to have the services of the apprentice judge, Joanne Ham who took training on both animals and fleeces and I thank all three for their level of professionalism and dedication in judging under some trying conditions. ■

Supreme Suri:
Baarrooka Elara



Supreme Huacaya:
Camelot Tor





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GRAND FLOWERDALE ALPACAS

Alpaca Behaviour

ANIMAL HEALTH AND WELFARE ARTICLE by **Elizabeth Paul** > Erehwon Alpacas, VIC

Many alpaca owners have come to the fascinating world of alpacas with very limited experience of any kind of animals, or their behaviour, either as a group or as individuals. Some new owners or breeders with small herds have run into problems with young males, which may be a nuisance at first, but which can quickly develop into a more serious situation. This may happen when alpacas are given the wrong kind of attention and petting from their owners, or when they are allowed to intrude into the owners' personal space because the behaviour is seen as 'cute'. In due course, the alpaca may try to start dominating the human, in the same way as it would start challenging for its place in the herd. In order to make more effective management decisions with our animals, we need to understand their behaviour from their point of view.

Wild Camelid Behaviour

In the wild, a mature male guanaco or vicuña marks out a territory (often with dung piles) and defends his patch, and the family group within it, against all comers. By the time the season's crias of both sexes reach about 12 months of age, he will expel them from his group, and they usually never return. The young females will be gathered into other family groups, thus avoiding close inbreeding. Young males form bachelor herds, without strong territorial bonds. As they don't have females or territory to fight over, they get along reasonably well with each other. These herds roam around waiting for an established male to die or become incapable of defending his patch, when the strongest/most mature male from the bachelor herd can challenge him and take over.¹ On the farm of course, the farm manager decides who will get the top job.

Paddock Behaviour

Alpacas, like all other animals, have a personal space boundary, and a place within the group. Each animal knows or is soon told by other members of the group of its place in the hierarchy. It also knows which other alpacas in the group it can dominate in turn. As a cria grows its place changes; and adding a new member to the group will involve a re-structuring of the hierarchy, which can be stressful for all concerned.

Body language is the communicating tool most used by alpacas to maintain their place in the herd. In a quiet, unstressed environment subtle shifts of ears, tail and neck are generally sufficient. Threat displays involve broadside posturing, tilting head back, and spitting.

The earliest behaviour of a cria is imprinted at birth. It is programmed to follow larger moving objects, and to sit beside or under large objects. The cria in Figure 1 has found a much bigger (therefore better) 'mother' than her birth mother to sit under.



Figure 1. Size matters!

Nursing behaviour involves the cria lowering its head to get under its mother's belly. The tail is also usually flipped right over on to the back (Figure 2).



Figure 2. Cria approaching dam for a drink, with submissive signs of tail flip and lowered neck.

Similar behaviour may be displayed later when the cria approaches or passes any other older alpaca (Figure 3). It signals the lower rank of the younger one, and reduces the likelihood of an aggressive response to a possible challenge.



Figure 3. Modified submission in a weanling deferring to older white male, with tail flip and averted head.

The cria that approaches a person with its head lowered and tail up over its back, is signalling the same way it would signal an older or more dominant alpaca. More subtle intrusive behaviour includes sniffing at crotch areas or feet, pulling shoelaces, rubbing up against the person, or even lying down and rolling over on the person's feet like a dog. (And a dog will do these things, for the same reason – to establish dominance). Crias like this have an identity crisis, i.e. they do not see humans as 'others' but rather, part of their own herd. These advances should be firmly and clearly rejected as unacceptable, without of course resorting to heavy physical interaction with the cria, which will only escalate the problem.

Orphaned crias, even if being bottle fed, should be left with the nursing herd if at all possible, and not be raised like bottle fed pet lambs. Crias are pretty good milknippers. In Figure 4 the smaller cria has discovered that if he waits for a female to get settled with nursing, he can steal a drink from between her legs. His own mother is sitting behind him. Orphans may even find a surrogate mum to take them on. In fact I have seen a cria, orphaned at two months, be adopted by an older female which had been dry for two years, but started nursing again.



Figure 4. Milk nipper.

Figure 5 shows a 'Mexican standoff' situation between two females of nearly equal rank. The female in the foreground is a little younger, but obviously thinks enough of herself to challenge the older grey behind her.



Figure 5. Broadside display between two females of about equal size and status. The younger female in foreground is the challenger.

The four square stance with the tail held rigidly away from the body makes her look bigger. The older female reinforces her status with a direct look back at the upstart. No doubt she will spit next, if the younger one fails to give way. Physical attacks are, however, not common between females.

Even very young male crias will mount other alpacas (including their own mothers when they are sitting down) in imitation of adult male behaviour (Figure 6).



Figure 6. Mounting (and spit off) behaviour starts very early.

Males will also play fight from an early age, which involves chest butting, neck wrestling, and biting at ears, necks, groins and feet areas. Young males which stand on their hind legs at the gate, or run along the fence line and stand on their hind legs when food is brought out to them are starting to display aggression towards people. (Males should not be handfed). They may stand broadside on with tail out, at a distance, when the owner comes into the paddock. They may even start running up to a person, with their head lowered to the ground and weaving from side to side. These are all preliminaries to see if the challenge to fight will be met. ➤

Some breeders have reported feeling uneasy when they go into a male's paddock, but are not sure why. If they feel threatened, there is probably a very good reason for it. Alpacas, like dogs, also know the sex differences in humans. Some breeders have observed that their male challenges either the husband or the wife; the husband presumably because he is a male and therefore a threat, or the wife because she is female and should be dominated.

The young male in Figure 7 has launched himself at his mother, with all four feet off the ground, in a chest butting display. His knees are raised to chest level, creating a very effective battering ram. He, presumably, wants to distract her away from being too interested in someone else's new cria. In a real fight, he will try to knock his opponent down in this way and then kneel on him.

Under no circumstances should this kind of physical contact be activated, between alpacas and humans.



Males who do any of the things described above need more activity, more alpaca company and reduced or different human contact. Finding a few mates of his own age for a solitary young male is probably the best thing to do, and the more the merrier. Changing the males to a new paddock occasionally, or putting food in the barn and calling the males in, reduces their attachment to a particular territory. Even being taken for a walk on a halter, puts the human back in charge.

Berserk Males

This term is used for an alpaca or llama, which shows continuous, extremely aggressive behaviour towards everything, other alpacas and humans alike. Berserk males will cause havoc in a group of other males, destroy existing hierarchies, and attack people.

In the USA, most young male llamas, raised in petting zoos, have to be put down before they reach two years of age, because they simply become too dangerous to be near humans at all.² Berserk males are not re-trainable. Responsible alpaca breeders and owners will take steps to not create them. ■

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Figure 7. In full flight - a cria launches himself at his mother in a chestbutting display.

Vallon De Or'o

17.6u, 3.1 SD, 17.6 CV

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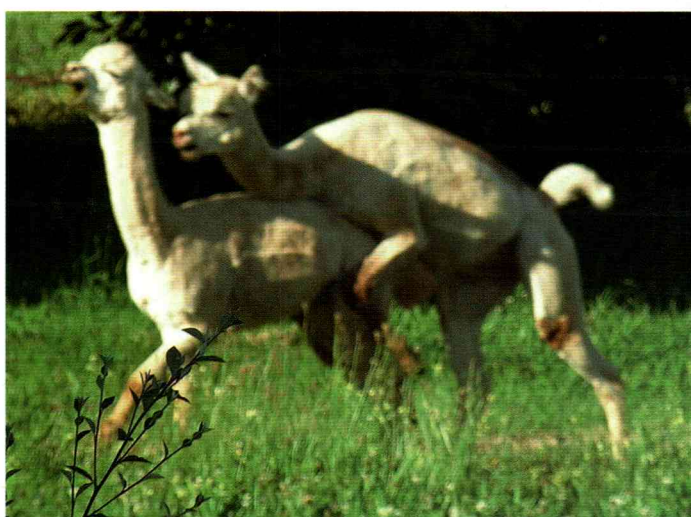
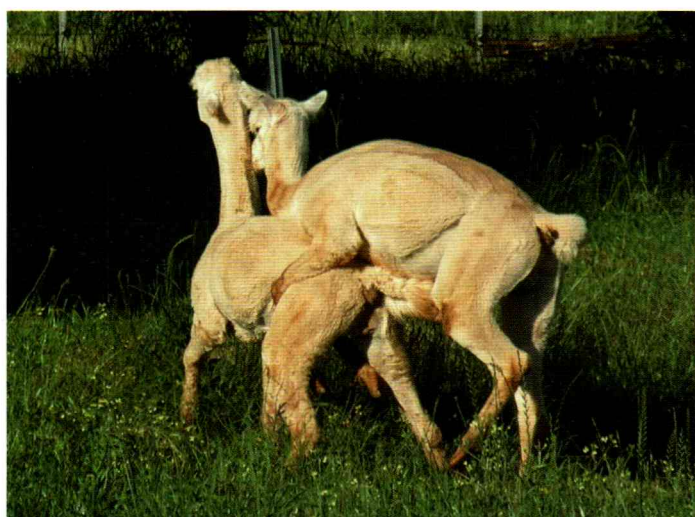
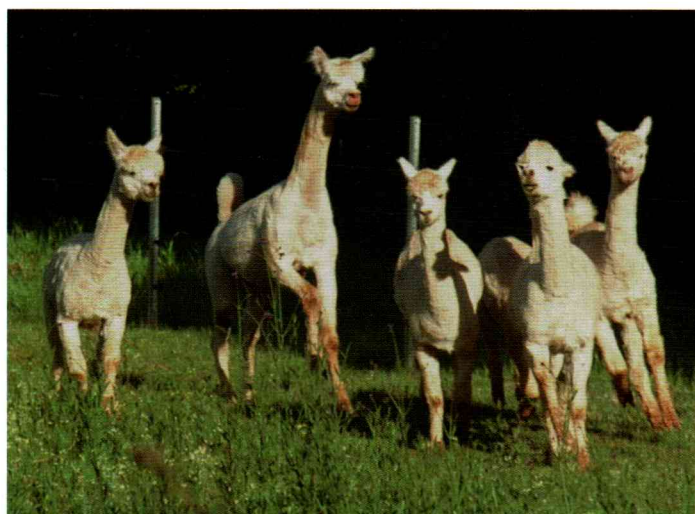
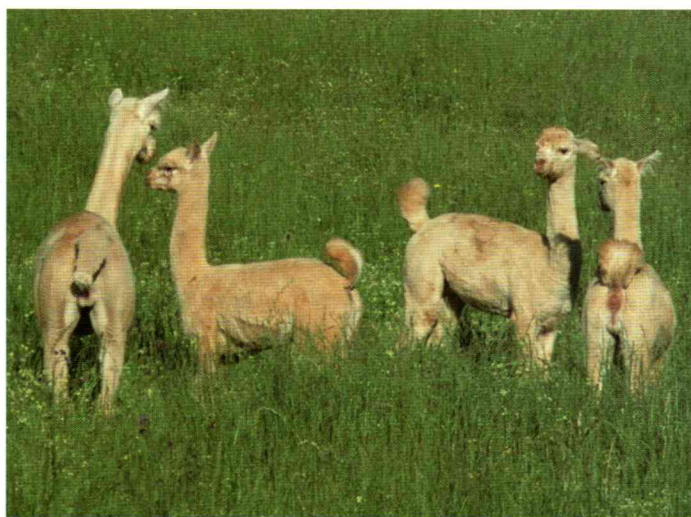
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The sequence of photographs below was taken by Pippa Smith
(Applegum Alpacas, QLD) when an established stud male
was introduced to a new group of wethers.
The body language says it all!



Notice the submissive posture of tails up. Then the older male picks on a less
submissive one and attacks. Eventually, this young male took flight and hid
alone amongst some trees at the bottom of the paddock, while the remaining
males followed the stud male obsequiously!

Worms and Drench Resistance

ANIMAL HEALTH AND WELFARE ARTICLE by **Elizabeth Garner-Paulin** > Tarraganda Lodge Alpaca, NSW
> Chairperson, AAA Inc. Animal Health, Husbandry & Welfare Sub-committee

Drench resistance is generally regarded as the most economically important sheep health problem in Australia today with an estimated 90% or more farms experiencing the phenomena. There is no sheep drench on the market today that is not affected to some extent. Unless unnecessary drenching is reduced, the cost of drench resistance to the sheep industry alone is estimated in excess of \$700 million per annum in the next five years. Less well documented but equally well known are drench resistance problems in other livestock industries.

The Australian alpaca industry is on notice with cases of drench resistance now appearing within our own industry. Whilst the vast majority of alpaca breeders embrace the concept of worms as a management issue and not a stand alone drenching regime, we must ALL review our practices and attitude to drench use now, or face the serious consequences of widespread drench resistance in our industry within a very short period of time.

Traditional worm control methods

Modern drenches have proven highly effective and easy to use and consequently have formed the centrepiece of parasite control for most livestock producers.

In the past, the recommended and easiest method of worm control was two (*and sometimes more*) drenches per year for the entire herd; the time of year for drenching would depend on geographical location and seasonal conditions.

In addition to whole of herd drenching, is the practice of indiscriminate drenching. If an animal is scouring or not thriving, then it is generally assumed that a drench will correct the problem before or without further investigation carried out.

What's wrong with this method?

It is well documented that the two methods of drench use outlined above, combined with incorrect dose rates are the cause of the immense problem of drench resistance today in other livestock industries; what has surprised everyone, is how quickly drench resistance has occurred.

Within other industries, new approaches to worm control in the form of integrated worm management are now being encouraged.

Alpaca breeders choosing not to heed the lessons of sheep graziers and who continue down the road of excessive and/or indiscriminate drenching; without doubt, will be contributing to a very difficult future for their own studs and this industry.

What is drench resistance?

Drench resistance refers to the ability of a worm to survive in the presence of normally lethal levels of a drench; in essence, 'survival of the fittest'.

Naturally resistant worms are not common in a population but they do exist. A genetic mutation allows them to survive the drench and then pass on their resistant genes to their offspring. Overuse of the same type of drench can further enhance the selection process of these genetic types of worms.

Under dosing is a critical factor in producing drench resistance, with sub-lethal doses of drench selecting intermediate strains of resistant worms.

*As resistance is developing, breeders may experience subclinical production losses that are not easily seen. When drench resistance hits critical level, the results can be catastrophic; most particularly in the case of Barbers Pole Worm (*Haemonchus contortus*).*

The Australian alpaca industry is not alone in the appearance of drench resistance in our Camelids. In 2003, the American Alpaca and Llama industries started recording resistance to both Ivermectin and Fenbendazole.

To demonstrate the frightening speed in which resistance can occur, following is a table outlining some drench release dates and just some of the reported location and date discoveries of drench resistance in the Australian sheep industry.

Worms of significance in alpaca

Alpaca are susceptible to both cattle and sheep internal parasites, however the burdens for many of these types of worms are rarely in disease causing proportions, most often due to alpaca latrine practices and good nutrition. It is important to determine what parasites pose a significant risk in your area by speaking to your vet and other local breeders and develop your worm control programme accordingly.

Year	Drench Released	Year	Resistance Discovered/Reported and worm type
1961	Thiabendazole (TBZ – BZ family)	1966	NSW <i>Haemonchus</i>
		1977	18% of New England Farms resistant – <i>Haemonchus</i>
1968	Levamisole (LEV family)	1979	NSW – <i>Ostertagia</i>
1982	Closantel	1987	Northern NSW – <i>Haemonchus</i>
		1996	Prevalent resistance Northern NSW – <i>Haemonchus</i>
1988	Ivermectin (ML family)	1993	Northern NSW – <i>Haemonchus</i>
		1994	WA – <i>Ostertagia</i>
1995	(Moxidectin – Cydectin) (ML family)	2000	WA – Approx 40% of farms have ML resistance
		2000	Northern NSW / Southern QLD – ML resistance <i>Haemonchus</i> more common
		2000	Southern NSW – First reports of ML resistance <i>Ostertagia</i>
		2003–2005	Approx 60% of WA farms have ML resistance <i>Ostertagia</i>
		2003–2005	Approx 30–60% of Northern NSW farms have ML resistance <i>Haemonchus</i>

Information from NSW DPI Agnote "Sheep worm control & drench resistance – no worries?", 2005 Stephen Love

The most challenging internal parasites for alpacas in Australia are:

- > Barber's Pole Worm – *Haemonchus contortus*
- > Small Brown Stomach Worm – *Ostertagia ostertagi*
- > Black Scour Worm – *Trichostrongylus spp*
- > Liver fluke – *Fasciola hepatica*

Drenches

Anthelmintics, or more commonly 'drenches', are products that contain a chemical or chemicals that kill the target worms. There are currently no drenches on the market that are registered for use in alpaca; however, their use under the direction of a veterinarian is permissible.

The following is a list of drenches commonly prescribed for alpaca by veterinarians in Australia, New Zealand and USA:

- > **Ivomec** – Ivermectin. Mectin (ML) family
- > **Ivomec Plus** – Ivermectin & Clorsulon
- > **Cydectin** – Moxidectin. Mectin (ML) family
- > **Closicare** – Closantel
- > **Panacur** – Benzimidazole (BZ) family, Fenbendazole
- > **Valbazen*** – Benzimidazole (BZ) family, Albendazole

(NB: * The chemical Albendazole, as present in Valbazen poses serious risk during early pregnancy and must not be used in that circumstance)

With the current drench resistance direction, it is possible that alpaca breeders will be faced with having to use a combination of drenches in the future.

Under no circumstances should drenching with multiple drenches be performed unless under the direction of a veterinarian.

Integrated worm management

With no new drenches coming on the market, all livestock industries are faced with having to reassess their management strategies in order to preserve the value and remaining efficacy of the drenches we currently have.

Strategic drenching

With the aim of maximising effect and reducing the number of treatments required, strategic drenching treatments are given at critical times of the year in relation to the epidemiology of parasite burden and in association with animal management.

Adult alpaca

Studies documented in 1999 RIRDC report 'Australian Alpaca Fibre, Improving Productivity and Marketing' described that adult alpaca can maintain a natural resistance to infection and routine drenching may not be necessary; and that age related resistance to worm burdens usually becomes established in the second year and should persist if general management and husbandry are adequate.

Dams, cria and weaners

Generally, alpacas most vulnerable to worm infestation are cria, weaners and pre and post parturition hembra.

With pre and post parturient hembra, it is the suppression of her overall immune system so her body may not mount a response to the developing foetus which in turn can leave her vulnerable to high burdens of worm infestation. Drenching of hembra post birthing can be appropriate.

Drenching of cria is not recommended unless the cria is under significant worm challenge. ➤

From a management perspective, most important is that cria, dams and weaners are kept on 'clean' paddocks and not permitted to run with large groups of adults where they can be exposed to higher levels of larvae.

By avoiding overstocking wherever possible, performing routine faecal egg counts to monitor worm burdens and not running cria, dams and weaners with large numbers of adults, you can reduce the incidence of excessive worm infestation and reduce drench requirements.

Quarantine drenching

There are two ways of inadvertently obtaining drench resistant worms; breed them yourself or import them.

Quarantine drenching of every animal that arrives on your property is imperative. Generally Ivomec has been sufficient for alpaca; however it is possible that a combination of drenches will need to be used in the future under veterinary supervision.

Irrespective of the size of the property, a quarantine area is imperative. Having received a quarantine drench, new arrivals should remain in the quarantine area for a minimum 24 hours, preferably 48 hours before release into a 'wormy' paddock so that any resistant worms that slip past the quarantine drench will be diluted by the drench susceptible worm population.

Refugia - Maintaining populations of susceptible worms

As the saying goes, "if you can't beat them, join them". We are never going to achieve eradication of worms. It is the drench resistant worms which are our major concern and we need to keep worms susceptible to the drenches that we have, in order to have some control over them.

So we need to think sideways and implement an additional strategy that will hinder the growth in population of the drench resistant worms.

Refugia is the maintenance of a population of worms that are sensitive to a drench or are in 'refuge' from a drench. The populations of worms in 'refuge' are those that were sitting in the pasture as eggs or larvae when drenching time came around and those inside an animal that missed out on a drench.

When treating all animals in a herd, only the resistant worms will survive. When drenched animals are moved to a clean pasture, only worms that are drench resistant will develop in that pasture.

However, if animals go back to a 'wormy' paddock, the drench resistant worms will breed with the drench susceptible worms to maintain a worm population that should still respond to drenches. In other words, the population of worms in refugia provides a pool of genes to dilute the resistant genes.



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Leaving some animals untreated; such as older wethers or retired hembra, will assist in maintaining a population of drench susceptible worms in 'wormy' paddocks, with faecal egg counts to monitor the health and safety of the animals.

Faecal egg count (FEC)

One of our greatest weapons in the war on worms and drench resistance is faecal egg count.

Some breeders are able and choose to do their own faecal egg count but your vet and state agricultural department can also perform FEC on a group or individual basis.

Performing FEC twice a year will give you a clear indication if your worm management strategies are working. Speak to your vet or agricultural department about the best time of year for FEC in your particular area.

Samples can be from individual animals or from the communal poo pile (avoiding soil) however individual samples are far more effective wherever possible, allowing you to identify particular animals with problems and also to show patterns of a herd parasite problem that may be developing.

Faecal egg count for drench effectiveness

Faecal egg counts for the efficacy of the drench you are using are very worthwhile. Collect samples 7-10 days after drenching, irrespective of the type of drench used.

Pasture and paddock management

The importance of pasture and paddock management cannot be understated in an integrated worm management programme.

This can prove extremely difficult in this time of drought and with smaller sized properties but keeping some essentials in mind will assist breeders:

- > Alpaca's general inclination to use toilet areas is a significant bonus in controlling worm infestation and certainly collecting poo is of benefit. It is worthwhile to note that during the height of drought with minimal or no pasture, animals will seek out green pick and even fussy animals can be inclined to graze around poo piles. This will increase the risk of worm infestation.
- > In moist and/or humid conditions, manure should not be spread on paddocks without composting.
- > SPELLING: Pastures need to be spelled for more than 10 weeks in autumn/winter for useful reduction in numbers of worm larvae. There are two influencing factors for this: a time lag of several weeks, or even months, between eggs being deposited in the manure

and the appearance of larvae on the pasture and also, larvae can survive for many months during cool conditions. Certainly in summer rainfall areas the time between storms during October and November can be hot and dry which provides a shorter life expectancy for larvae; spelling paddocks during these dry times can reduce larvae later on. Contact your state DPI or RLPB to learn more about grazing strategies in your local area.

- > ROTATIONAL GRAZING: Cell and rotational grazing systems, with frequent rotations between paddocks, generally do not leave sufficient time between grazings to significantly reduce pasture worm contamination levels. During the cooler and wetter months of the year this could require several months stock-free.
- > CLEAN PADDOCKS: Maintaining areas for dams, cria and weaners that have not been grazed by large groups of adults for 100+ days will assist in reducing exposure to high levels of larvae during a vulnerable stage.

The alpaca industry has faced and will continue to face many challenges and breeders' willingness to embrace new practices places us in a strong position for a successful and viable future. Every worm programme should be tailored specifically to the individual farm and this must be done in conjunction with your veterinarian. ■

Acknowledgements

With thanks to Dr Pierre Baychelier.

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Holly's Story

ANIMAL HEALTH AND WELFARE ARTICLE by **Robyn Harrison** > Samsuri Alpacas, Queensland

Holly is not only my personal little miracle, but she is now world famous for being the first alpaca to have a Patent Ductus Arteriosus operation successfully performed!



Holly was born on 30 December 2005 to one of my black suri girls. She was my first female cria and a dark grey suri so I was very excited. It was an extremely hot day and when I found her in the early afternoon, she didn't get up, but stayed cushed and let me stroke her. I was immediately concerned that she may not have been able to feed (and therefore missed out on the colostrum), so took her straight up to

the vet for plasma. After returning home, she still didn't have the strength to stand and feed, so I began bottle feeding her.

After three days and no improvement, she went back to the vet. She had a normal temperature, and no sign of anaemia, but had developed some diarrhoea and was collapsing in apparent exhaustion after a short feed. She spent three days at the vet on a drip and had two more lots of plasma, some antibiotics and various other drugs. She seemed to recover well and the vet suggested that she may have been born with an infection. In the meantime, her mother had developed mastitis, but that is another story! After another week of bottle feeding, Holly was strong enough to suckle from her mother, who despite her mastitis and two weeks of no suckling, began to produce plenty of milk for her!



At seven months of age, Holly was still only 18kg and although she was eating very well, she wasn't growing as she should. She was lethargic and spent a lot of the time sitting quietly on her own. Holly also had a continuing respiratory infection that antibiotics just couldn't cure. After some investigation, the vet discovered she had a heart murmur and the X-Ray showed an enlarged heart. There are several potential causes of the enlarged heart, including a faulty valve, a hole in the heart and a bacterial infection around the heart. The only way to know for sure was an ultrasound.

So the vet cardiologist was called, and an ultrasound was performed. Holly had "the biggest hole in the heart" he had ever seen. He actually videotaped the ultrasound to show other vets, and was incredibly excited about it! I wasn't quite so excited, as the prognosis was that Holly would die from heart failure within six months. Apparently it was a miracle that she had survived for this long.

Holly had a Patent Ductus Arteriosus (PDA). The ductus arteriosus is present before birth to direct the blood away from the non-functioning lungs (the placenta provides oxygen in the womb) and normally closes after birth, but in Holly's case it had stayed open. The PDA causes the oxygenated blood from the left side of the heart to recirculate back to the lungs through the pulmonary artery instead of going out to the rest of her body. So she had too little oxygenated blood in the rest of her body, and too much going around her heart. This put a lot of pressure on her heart and arteries to the lungs.

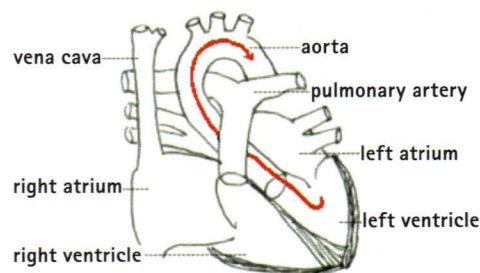


Diagram of the normal heart: blood flows from the left ventricle, into the aorta, and then out to the rest of the body.

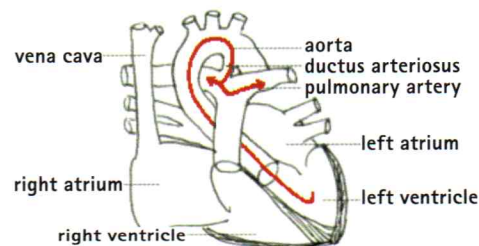


Diagram of a heart with a PDA: blood flows from the left ventricle, into the aorta, and into the pulmonary artery (instead of going to the body).

The vet cardio-thoracic surgeon was quite excited about this "once in a lifetime" opportunity to operate on a PDA on an alpaca. He had repaired many PDAs on dogs, but this operation had never been successfully performed on an alpaca (anywhere in the world). The two previous attempts on alpacas were unsuccessful. To the best of my knowledge, no vet in Australia had ever attempted a surgical repair of a PDA on an alpaca before. So despite the risks of surgery, the benefits far outweighed the risks. She had no quality of life and was going to die in the paddock if we didn't try. With some fear and trepidation, I booked Holly for surgery on 21 August 2006.

She was fasted for 36 hours prior to surgery with no water for the 12 hours before to reduce the risk of regurgitation under anaesthetic. The surgery took three hours. The incision was made under her left front leg (in the armpit region) and the ductus arteriosus was ligated (sutured closed). Despite the vet's concerns about the length of time she was under the anaesthesia, within four hours Holly was back on her feet and eating and drinking. The next morning her lung sounds were normal and her heart murmur was completely gone. She was placed on antibiotics, pain killers and anti-inflammatory drugs and confined to a stable for a week to ensure the wound was healing and that she wasn't putting too much strain on the stitches. It appears that she is not only my personal little miracle, but she is now world famous for being the first alpaca to have this operation successfully performed!

The vet's comments were that although it was the largest PDA he has ever worked on, generally speaking it was much the same as operating on a dog, so any vet that can repair a PDA on a dog, can repair one on an alpaca. The main concern with any surgery on an alpaca is that they tend to regurgitate under the anaesthetic and therefore risk aspiration and the chance of drowning in their own digestive juices. But if the vet taking care of the anaesthesia is trained to deal with ruminants, the risk can be managed. The other issue with alpacas is that they tend to stress when confined alone. Holly has a gentle and laid-back personality (and a stubborn streak and strong will to live), so she didn't suffer stress like some alpacas do, and we are sure that this has helped in her survival and recovery.

My thanks go to Brian Sheahan and his team at Samford Valley Veterinary Surgery for their assistance during the operation and the post operative care, and to Jason Beck of Queensland Veterinary Specialists for performing the surgery.

Holly gained about a kilo a week for the first two months after surgery and she is now 15 months old and the same size as an 11 month old cria in the same paddock. Holly is bouncing with energy, she runs and skips and enjoys her new lease on life. ■



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A New Angle on Alpaca Conformation

ANIMAL HEALTH AND WELFARE ARTICLE by **Dr Pierre Baychelier** > Alcazar Suri Stud, NSW

Now that our alpacas have been shorn, it is the best time to assess their conformation.

Introduction

Conformation can be defined as the shape or contour of an animal, resulting from the appropriate arrangement, or balance, of all body parts.¹ It should not be confused with *anatomy or morphology*, which is the form and structure of organisms.² All alpacas have the same anatomy but individuals differ by their conformation. In particular, conformation is what gives an animal its type. Conformation is also very important to the health and well-being of the animal and is discussed in breed standards.^{4,5,7,8,10,14}

The terminology used to describe conformation is rich, precise, poetic, often confusing, and sometimes redundant. There are basically two descriptive jargons: the veterinary/biologic terminology and the more current breeders' terminology. In this article, I will try to offer a new angle on alpaca conformation by concentrating on what is normal (the ideal conformation), rather than abnormal, with an emphasis on conformation of the limbs.

Ideal alpaca conformation

Figure 1 is a diagram of the ideal conformation of an alpaca. The proper (anatomical) terminology is set out in Figure 2.

Some important points should be noted. A few names have been assigned to some animal body parts because they resemble areas in the human body; however they are not the analogous animal counterparts of the human structures. For example the *knee* is really a wrist (carpus), and the *ankle* is actually the metacarpo-phalangeal joint (or metatarso-phalangeal joint for the hind limb). The real knee is called the *stifle* and the real ankle (tarsus) is called the *hock*. The *withers* correspond to the region between the two shoulder blades. The back follows the withers and becomes the *loins* beyond the last rib. The *rump* or *croup* corresponds to the sacrum and is always very bony in alpacas. The expanded *iliac* crests which can be felt under the alpaca rump are one of the Camelid adaptations to allow for the pacing gait.

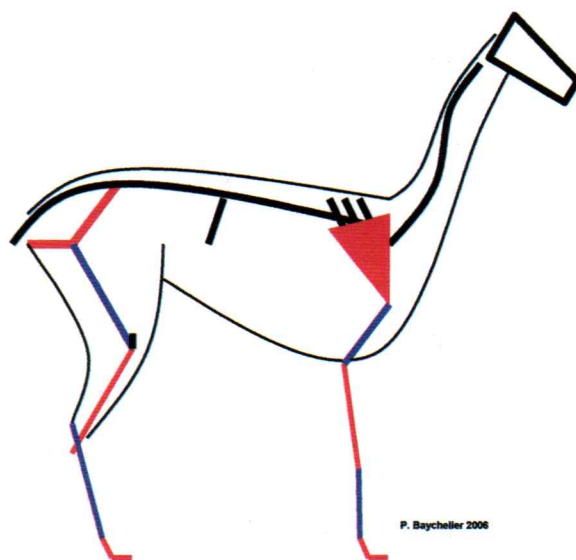
Figures 3 and 4 illustrate the important proportions, ratios and angles which form the basis of the ideal alpaca conformation. The most original alpaca characteristic is that the hindquarters are only slightly higher than the forequarters, as all Camelids have fore and hind limbs of approximately equal length.¹¹

In Figure 4, distance **D** is the distance between the *point of the buttock* and the ground and it should be equal to the distance between the *hip* (or the *hock*) and a vertical line through the *shoulder joint*. Distance **d** is the distance between the elbow and the ground. It should be equal to the depth of the body, and to the length of the neck (up to the *occipital protuberance*). However, in crias this is not the case, as the distance between the elbow and the ground is approximately twice the depth of the body.

Distance **d** is approximately 2/3 of distance **D**. More exactly, on Figure 4, the ratio **D/d** is 1.62. This is a very common ratio in natural structures, and has been used for centuries by architects and artists to achieve ideal proportions in their work. It is called *phi* (ϕ), the Golden Ratio or Divine Proportion.

The alpaca pelvis forms a 50° to 60° angle with the horizontal. The pastern angle is at least 65° to 70° to the ground, and even more, especially for the front pastern (up to 80° to nearly vertical). When resting, the neck and head should be held at approximately 25° to the vertical. Normal angulation of the hock should be approximately 140°.^{1,3,9,10,13,14}

Figure 1 – Ideal alpaca conformation



The height at the *withers* in an adult alpaca should be approximately 90 cm but can vary from 75 to 102 cm, depending on sex and country of origin.^{1,9,10,14}

Front and rear views are not illustrated as it is easy to understand what the ideal alpaca conformation should be: "Viewed from the front, a plumb line held at the point of the shoulder should bisect each bone and joint from the knee down, and the plumb bob should end between the toes.

Viewed from the rear, a plumb line held at the *pinbone* (other name for *point of the buttock*) should approximately bisect each bone and joint and the plumb bob should end between the two pads of the rear foot."¹

Similarly, conformation of the head and other parts of the body such as genitalia are not illustrated. The reader is asked to refer to other easily available publications for further descriptions.^{1,3,5,7,8,10,14} ➤

Figure 2 – Essential anatomical terminology

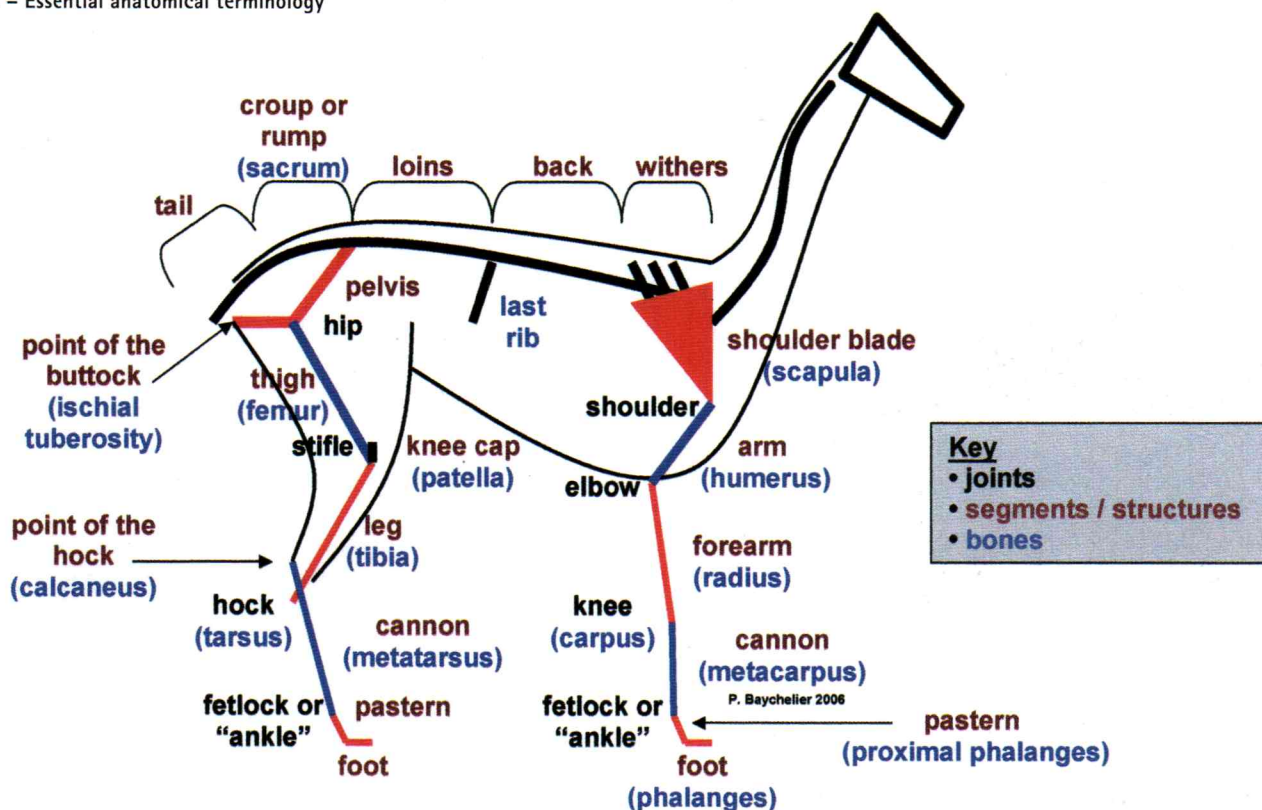


Figure 3 – Ideal alpaca proportions

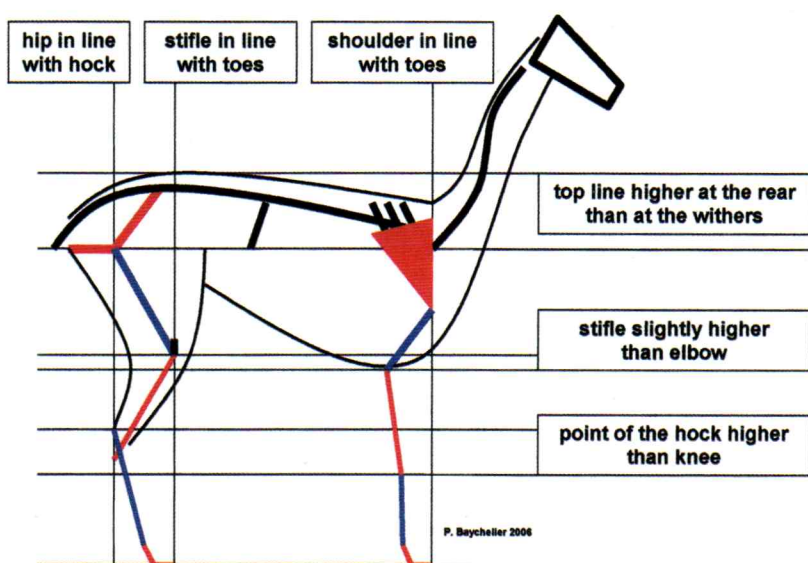


Figure 4 – Ideal alpaca ratios and angles

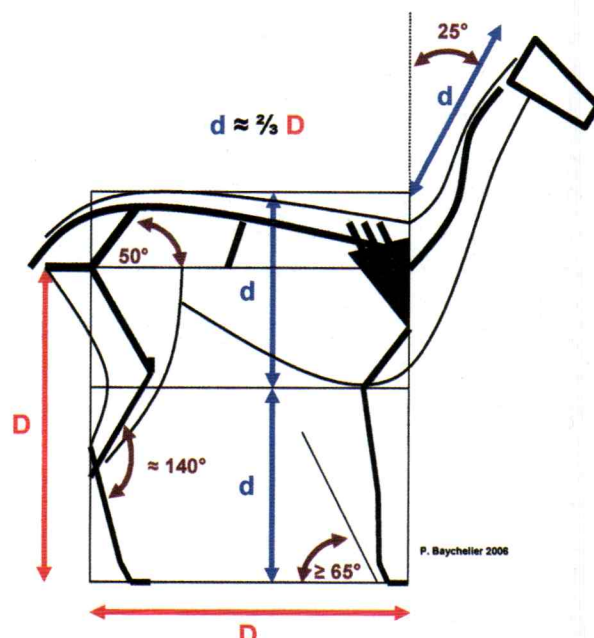


Table 1 – Conformational faults affecting the limbs

Joint	Hyperflexion	Hyperextension	External deviation *	Internal deviation *
Shoulder	Camped rearward in front	Camped forward in front	Base-wide (external deviation of the whole limb at the shoulder)	Base-narrow (internal deviation of the whole limb at the shoulder)
Elbow		Straight-legged (hyperextension of elbow and shoulder)	Out at the elbow	In at the elbow
Knee	Buck-kneed	Calf-kneed, Sheep-kneed	Bow-legged (carpal varus)	Knock-kneed (carpal valgus)
Fetlock (front or rear)	Cocked ankle	Down on fetlock, dropped fetlock, weak pastern	Pigeon-toed, toe-in	Splay-footed, toe-out
Hip	Camped forward behind	Camped rearward behind	Base-wide (external deviation of the whole limb at the hip)	Base-narrow (internal deviation of the whole limb at the hip)
Stifle	Crouched (resulting in rear quarters lower than withers)	Post-legged	"Out at the stifle"	"In at the stifle"
Hock	Sickle-hocked		Bow-legged (tarsal varus)	Cow-hocked (tarsal valgus)
Knee cap			Lateral patella luxation	Medial patella luxation

* in the frontal plane

Yellow cells indicate serious faults.

Conformational faults

The majority of the common conformational faults affecting the limbs can easily be understood by referring to the joint involved. In these faults, the joint is either in hyperflexion, in hyperextension, or is angled in a plane in which it is not designed to normally move. The latter point deserves an explanation. In Ungulates, of which alpacas are members, the limbs display a number of modifications that adapt them for speed. There are essentially three modifications:

- (i) elongation of the segments;
- (ii) reduction of the number of bones in each segment to only one main bone;
- (iii) transformation of the joints into pulley-like structures which greatly reduce or totally eliminate lateral movements.⁶

Sometimes these joints are not formed properly and result in lateral movement or permanent lateral deviation. The names of the most common conformational faults affecting the limbs are found in Table 1 (*above*).

Discussion

It is of the utmost importance to the health and well-being of alpacas that breeders know and understand the basic anatomy of their animals. It is only by knowing what is normal and desirable that one can recognise what is abnormal and undesirable. Knowing the term(s) used to describe a conformational fault is not as important as being able to identify it. Current standards focus too much on listing conformational faults and do not describe the ideal alpaca conformation in sufficient detail.^{5,7,8,10,14} Essential anatomical terms are not always defined. Moreover, these standards are sometimes incorrect or at least confusing, as illustrated by the following examples.

The chest is not broad, but deep and narrow. The rump is not broad either, but also narrow. In fact, Camelids are amongst the most narrow-chested and narrow-rumped Ungulates and this is one of the reasons why they can pace naturally: "Camelid limbs are set more closely to the midline than in other species, eliminating some of the side to side rolling that occurs when the center of body gravity is changed with each stride."³ Other anatomic modifications found in Camelids which allow them to pace naturally include: long front and hind limbs of approximately equal length and longer than the trunk, absence of skin fold attaching the thigh to the flank, small abdomen ('tucked-in belly'), broad flat ribs, expanded iliac crests, large scapula, and a unique splayed two-toed padded foot.^{3,11} All these characteristics put together allow for a longer stride and increased lateral stability.

The height of the pinbone does not equal that of the shoulder. The pinbone (or point of the buttock) and hip are substantially higher than the shoulder. The term shoulder refers to a joint. Unfortunately *shoulder* is sometimes used to describe the entire shoulder blade area. In any case, the pinbone is higher than the shoulder *joint* and lower than the top of the shoulder *blade* (see Figure 3 - page 27).

It is also generally assumed that the toes should be pointing forward, an especially useful indicator of correct conformation on heavily fleeced animals.^{12,13} For example, J. Ault states: "The toes should point forward. An indication of normal conformation would be toes that point forward. Toes that do not point forward may indicate poor conformation or poor toenail trimming. In either case, toes that point forward are important to structurally sound animals."¹² This is not entirely correct. Although the axis of the foot does point forward, the toes do not necessarily point forward but can form a slightly open V.

The toes on each foot are not always parallel to each other, as the Camelid foot is splayed. This is more pronounced on the front foot than on the rear foot.

Some authors recommend that the line dropped from the point of the buttock should touch the back of the hock and that the rear cannon should be vertical.¹³ Our observations lead us to believe that this is a llama characteristic. An alpaca with such a conformation would be considered as camped rearward in the hind legs. The drawings and descriptions found in other references certainly suggest that alpacas are 'conformationally under themselves', compared to llamas.⁹ The difference in angulation of the pelvis (50-60° in alpacas vs. 40° in llamas) and of the pastern (at least 65° in alpacas vs. 45-50° in llamas) certainly support this important difference in conformation.^{1,3}

Conclusion

Breeders should spend time studying and understanding the anatomy and observing the conformation of their shorn animals. Repeated observation and objective assessment are the best means for developing an 'eye' for conformation and will help in the selection of superior animals. As recommended by Dr Karen Timm, "when choosing or evaluating alpacas, [...] leg conformation as close to ideal as possible should be a primary consideration."¹³ ■

Acknowledgements

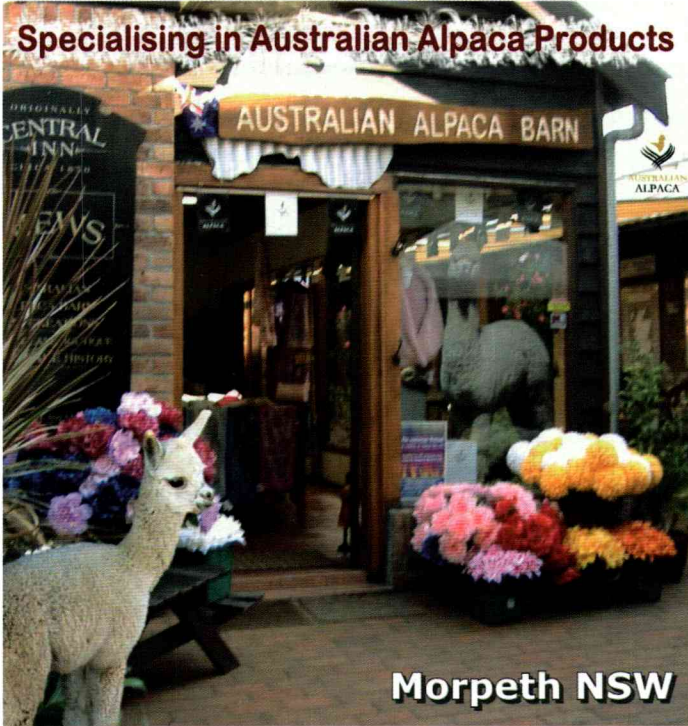
The author wishes to thank Mr Brenton Spehr for his help in the writing of this article.

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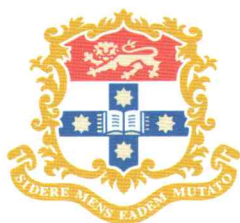
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Sydney University Camelid Research 07

RESEARCH AND DEVELOPMENT ARTICLE by **Dr. Katherine Morton** > *Post-doctoral Research Fellow*
Centre for Advanced Technology in Animal Genetics and Reproduction (ReproGen), Faculty of Veterinary Science,
The University of Sydney, 2006.



Last year proved to be highly productive. In August, Professor Chis Maxwell and I attended the [7th International Ruminant Reproduction Symposium in Wellington, New Zealand](#). Professor Maxwell was an invited speaker, presenting his work about 'Seminal plasma effects on sperm handling and female fertility' to an audience of over 400. I presented some of my work on the cryopreservation of epididymal alpaca sperm. The symposium was a fantastic opportunity for Professor Maxwell and I to discuss camelid research issues with Professor Tibary and Dr. Skidmore. Dr. Skidmore had visited our laboratory before flying to NZ when we spent the day touring the facilities and meeting (and cuddling) the alpacas.

After NZ, I flew to Adelaide to give an oral presentation at the [AAA conference in Adelaide, South Australia](#) on the progress made in our project. It was my first AAA conference and I was delighted to discuss our work with so many people and the fantastic questions that were asked. It was such a great opportunity to meet people so knowledgeable about alpacas. From Adelaide I returned to Sydney to spend two hectic weeks organising experiments and completing preliminary research proposals.

I then left for the [European Society of Domestic Animal Reproduction \(ESDAR\) conference in Slovenia](#). The conference was organised by a colleague I met while working in Germany. It was great to catch up with my friends in Germany and I had the opportunity to meet some scientists who worked with camels many years ago, authoring one of the early FAO reports on camel reproduction.

I returned to Sydney after some all too brief holidays and in late October Professor Maxwell and I hosted a visit from the [RIRDC Rare Natural Fibre committee](#) and AARPL Chairperson, Iona McKinnon at our laboratory at Camden. I presented an update of our research results and Professor Maxwell gave an overview of our plans for a second project. After the presentations, our visitors were given a tour of the lab facilities, a demonstration of AV construction (*pictured right*) and a viewing of liquid-stored alpaca sperm.



Sarah Wilson (left) and Zamira Gibb (right) demonstrating how to construct an alpaca AV for semen collection.

Our visitors were then treated to a BBQ lunch and drinks – expertly catered by Sarah and Zamira who managed to find the time, despite the fast approaching deadline for their honours thesis. Sarah and Zamira completed their honours projects at the end of October and they will graduate in March this year. Zamira has decided to stay with the group and will start her PhD in March investigating the sex sorting of stallion sperm. Our annual progress report (53 pages this year!) was submitted to RIRDC in November. The report outlined our advances and development of protocols for the handling and assessment of alpaca semen, and liquid and frozen storage of alpaca sperm.

2007 is shaping up to be another busy year...

Our RIRDC funded project comes to a close in July and we are busily planning experiments to refine the protocols we've developed, analysing data, and writing scientific papers and reports. We're also hoping to squeeze in a field trial as well!

Professor Maxwell and I have just submitted our full research proposal for 2007-2010 to RIRDC. The proposal aims to **identify and characterise the molecule responsible for the viscosity of camelid seminal plasma**. From our observations during our experiments, and from discussions with other prominent camelid scientists, the viscous seminal plasma is considered the major hindrance to developing efficient methods for semen preservation. Previous studies have stated that a mucopolysaccharide from the bulbourethral gland causes the viscosity.

However, there is no scientific evidence for this, and our preliminary results suggest that it is a different type of molecule. We are planning to use recently developed proteomics techniques to examine and characterise this component of semen before developing a method to eliminate the viscosity. **We've enlisted the help of two internationally renowned camel scientists on this project - Professor Ahmed Tibary and Dr. Lulu Skidmore.**

Professor Tibary obtained his veterinary doctorate degree from Morocco in 1980, followed by a MSc (1984) and PhD (1989) from the University of Minnesota. Professor Tibary is currently working at the College of Veterinary Medicine at Washington State University where he specialises in Theriogenology (Animal Reproduction). Before joining the College of Veterinary Medicine, Professor Tibary was the scientific director of the Veterinary Research Centre in Abu Dhabi where he was in charge of developing the infertility clinic and artificial breeding program for Arabian horses and racing camels.

Dr. Skidmore is another renowned camelid researcher. Dr. Skidmore is the principal scientific officer at the Camel Reproduction Centre (CRC) in Dubai. She gained her PhD from the University of Cambridge in dromedary camel reproduction and has over 14 years experience in the preservation of camel embryos and semen. Professor Tibary and Dr. Skidmore are as excited as we are about the prospect of investigating the cause, and developing a technique to overcome or circumvent the viscous seminal plasma in camelids.

Professor Maxwell has been invited to speak at this year's **European Society of Domestic Animal Reproduction (ESDAR) conference to be held in Celle, Germany**. Professor Maxwell's presentation 'Seminal plasma effects on ruminant and camelid sperm function during processing for storage or sex-sorting' will contain some of our exciting data on the changes in protein profile of camelid seminal plasma after enzyme treatment and over different seasons.

At the moment, I'm validating computerised assessment of alpaca sperm. In the Veterinary Science Faculty we have a FACS (fluorescence activated cell sorter) which is a machine that is able to sort cells (in our case, sperm) into different groups according to their fluorescence. To assess the alpaca sperm, we stain them with different types of fluorescent dyes to determine if they are alive or dead, and have intact or disrupted membranes.

The FACS is able to assess over 7,000 sperm per second – which is a lot faster and more efficient than me manually counting 200 sperm on a microscope slide! Another advantage is that FACS assessment is objective rather than subjective which makes it a more scientifically valid type of assessment. Unfortunately, FACS, like many of the other recently developed techniques has yet to be developed and validated for alpaca sperm.

I'm also in the process of writing a book chapter about semen collection, preservation and AI and preparing a number of scientific publications about the preservation of alpaca sperm. Last year I managed to demonstrate that epididymal alpaca sperm could be liquid-stored without any loss in motility which was one of the most fascinating findings for me.

Another of our ongoing experiments is investigating the level of testosterone in the blood of male alpacas. We've found that the level alters depending on the time of the year, and the peaks in testosterone level correspond with peaks in semen motility. While this is very interesting, and suggests that alpacas could potentially be seasonal in Australia, we need to collect and assess more data before any firm conclusions can be drawn.

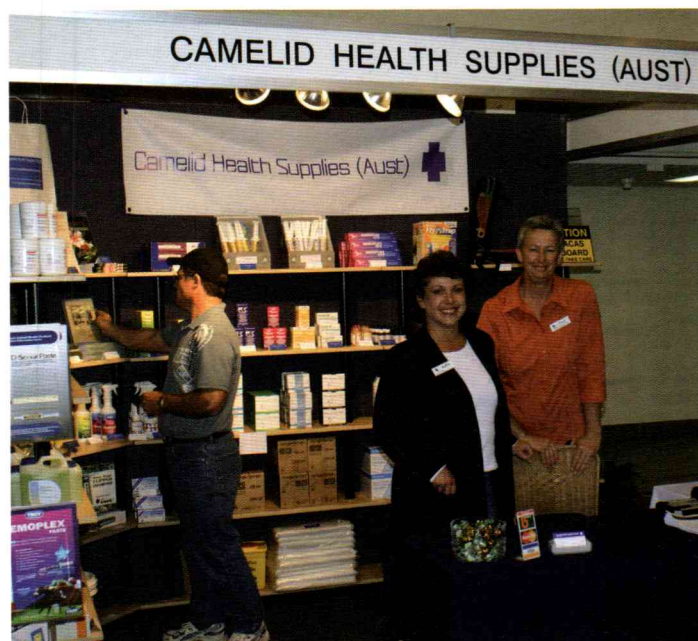
At the moment everyone on the research team is busily rushing around trying to finalise experiments. We're amazed at how quickly time has passed and we're hoping that our grant will be successful and that we'll be able to continue our fascinating studies on the alpacas for another three years! ■

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Blazing a Trail in the Alpaca Industry

INDUSTRY ARTICLE by **Libby Garner-Paulin** > Tarraganda Lodge Alpaca, NSW

Tracy Pratt (Indigo Alpacas) & Libby Garner-Paulin (Tarraganda Lodge Alpaca) teamed up to start Camelid Health Supplies (Aust).



Tracy Pratt (right) and Libby Garner-Paulin (left)

Our journey started organically. Last year, we were no different to other breeders during the drought, with animals in our respective herds experiencing mineral deficiencies. We'd been recommended Propaca by other breeders and were elated that there was a mineral supplement specially formulated for Camelids. Our excitement was pretty short lived though because it was the same old story from the Produce Store, *"we don't normally stock for alpaca, so will have to order it in for you"*. The problem was that there were delays with the distributors and it meant the whole process turned into weeks. The Propaca was sitting in a warehouse somewhere, whilst our animals were sitting in the paddock in dire need of the supplement. We weren't alone in our frustration, even the manufacturer was in despair.

There was a synchronicity in that it was the last straw for both of us. The light bulb went on and we knew without doubt that we could do a better job than the existing supply chains. In the wake of the saga that we had all just endured, we approached the manufacturer of Propaca about providing reliable distribution for the alpaca industry and they jumped at the chance.

Where our partnership works so well is that apart from being friends, we have the same vision and goals for what we're doing.

Our individual strengths cover all the bases and we work with mutual respect. We're also having a really great time, even if it is a lot more work than we imagined. If you're good at what you do and you enjoy it, then you're most of the way there.

Getting started wasn't as easy as we thought it would be. With the real exception of International Animal Health Products, most manufacturers and supply companies simply weren't interested when we mentioned 'alpaca'; nor did they have any idea of the range of health products alpaca breeders use. Obviously, not one of them knew what a Camelid was, which made for some lengthy and interesting telephone conversations.

The concept of what we're doing isn't new; we're just taking it to another level. To start, we sat down over a crisp Semillon and brainstormed where the current supply system fell down for alpaca breeders and how we would alter it. Product knowledge was paramount, flexibility of business hours was important, delivery service had to be reliable and efficient, the website had to be user friendly and the facility had to be there for people who weren't online. To complement mail order and freight, the addition of a free pick up service at selected alpaca shows and events has been hugely popular and a real cost saver for breeders. A distribution network with other breeders to expand this service into other states is definitely in the pipeline.

That we're a part of this industry and the breeders' grapevine adds a valuable dimension. We either use the products on our own animals or we go by request and referral from other breeders and vets. We're interested in learning, so we listen to what breeders have to say.

The general supply companies don't always understand the importance of needing some items urgently. In the case of an orphaned cria or a dam that's slow to come into milk, the 1kg formula on standby doesn't go far and back up supplies are needed – fast. Tracking down the formula and delays in delivery is an added pressure breeders simply don't need during a difficult time. That we're available seven days a week and outside of regular hours is really important because as we all know, alpacas simply don't appreciate the concept of weekends and business hours.

The support and encouragement we've received from the industry has been a tremendous boost. Breeders keep coming back for their supplies and we value that because it means we're on the right track. We were pretty sure that new breeders would appreciate more support. It can be pretty daunting, particularly if you're new to livestock and we're happy to spend time answering questions about products and alpaca care. We believe the service we provide is just as important as the products we sell.

The National Show and Sale in Canberra last year was full-on but a heap of fun; breeders would drop by to pick up their supplies and share stories about their animals, as we all love to do! With Murphy's Law in full operation, of course, two of Libby's females who were overdue decided to give birth that weekend. With Libby's husband at home holding the fort, mobile phones were running hot but our customers were very understanding of the interruptions because they've been there themselves. Many even dropped back later to find out the result.

We're really looking forward to coming down to the Nationals in Melbourne this year, the venue sounds terrific and it will be great to put faces to the names of breeders who we've supplied but haven't met in person.

The old saying that women love shopping and can sniff out the must have items certainly applies to us when it comes to products for alpaca. Manolo Blahniks on sale? No, not for us thank you, the work boots do just fine but put us on the trail of something new for alpaca and the excitement really kicks in. This frenzy of activity is most usually preceded by "Hey, what do you think of this idea ...". That's how the satin show fleece bags came about. Everyone is time poor and many of us don't sew; it made sense to be able to provide breeders with satin bags for their show fleeces.

One of our first sourcing efforts was the Kruuse disposable needles. Subcutaneous injections can be really difficult; many breeders make a sleeve from a needle cover and it works well but we figured there must be a short length disposable needle somewhere in the world that is suitable for subcutaneous injections. We also wanted a shorter length for a large gauge needle because the rear end of an alpaca isn't nearly as well padded as a cow or horse. We found them both and as luck would have it, at the same place, even though the same place was in Europe but we overcame that hurdle as well.

A new item on our product list is the Cria Resuscitation Equipment. It has really proved itself and is very easy to use. The resuscitation equipment is made in New Zealand by McCulloch Engineering and we know it's a valuable item to have, so we're very happy to supply and recommend it to breeders.

Another beauty that we're really excited about is the "Cria Sling and Scale". The scale is hand held and digital, so you can take the scale and sling to the cria in the paddock rather than taking the cria to the shed, or finding a flat piece of ground for the bathroom scales. It took quite a bit of effort tracking down a quality scale for this but it was worth the effort. It's going to make weigh day for cria that much easier. Weighing fleece saddles will also be a lot simpler and faster because the fleece bag is simply hung on the hook.

What we have achieved thus far would not have been possible without the support and advice of our families and friends. Tracy's mum, Lorraine really deserves special credit, she's a whiz on the sewing machine and has devoted serious effort and hours into helping us get off the ground.

A valuable quality in alpaca breeders is that they're willing to think outside the square and if the existing trails aren't quite right, then it's time to blaze a new one. ■

Camelid Health Supplies (Aust)



Cria Care Flutter Teats, Cria Resuscitation Equipment, Impact Colostrum, Oilskin Cria Coats with thermal lining, Biolac Milk Formula, Wombaroo Milk Formula, Obstetric Lubricant, Umbilical Clamps, Buffered Iodine, Latex Free Gloves

Health Support Wide variety of Needles and Syringes, Propaca, Protexin, D-Scour, Rescue Remedy, Hemoplex, VAM, Coforta 100, Selvite E Selenium, ADE, Vitamin B Complex, Vitamin C, Ironcyclen, Yearling Oilskin Coats

Husbandry Digital Thermometer, Toenail Clippers, Clipper holsters, Thermo Vaccine Holder, Drench Belt Holster, Stethoscope, Surgical Scissors, Gauze Swabs, Alcohol Wipes, Chloromide, Repel X Fly Repellent, Bandages, Otiderm, Thermal Blankets, Sharps Containers, Fleece Bags

Reference Books Antenatal, Birthing & Cria Care; Natural Goat & Alpaca Care; The Complete Alpaca Handbook; Medicine & Surgery of South American Camelids; Llama, Alpaca Neonatal Care; Alpaca Addiction; An Alpaca Alphabet; Pretty but Poisonous

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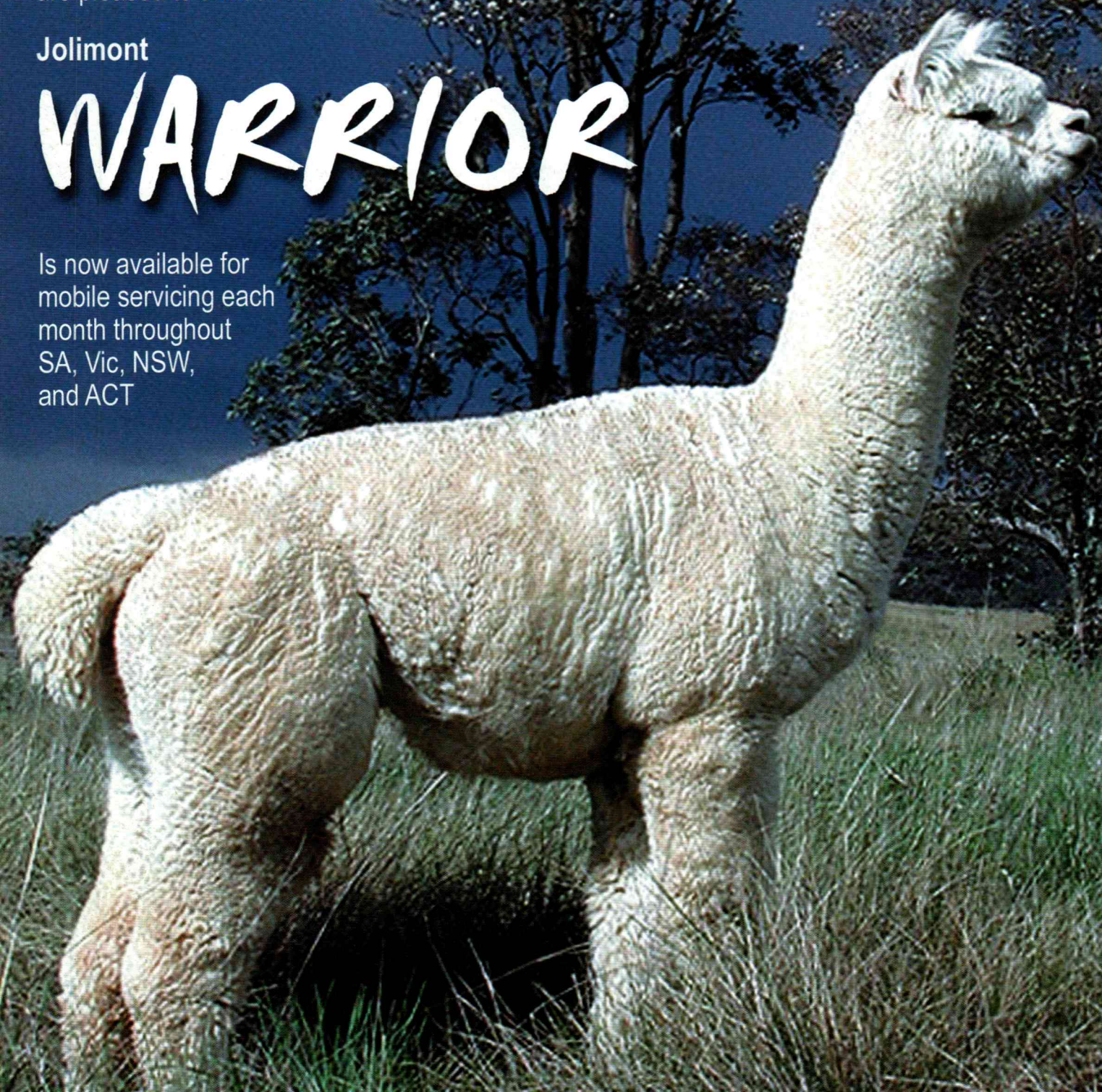
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Fine Choice Bijou	IAR 50392	LBR	mated to Flame	Due Mar 07
Fine Choice Myra	IAR 66449	SDF	mated to Flame	Due Jan 07
Fine Choice Charlotte	IAR 55187	SLBR	mated to Flame	Due Nov 06
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* Package price available, price may change after cria are born

Covering Sires:

Fine Choice Peruvian Travolta - solid white, imported Peru.

Benleigh Golden Flame - solid medium fawn (Benleigh Flame x Purumbete Inti.)

For further information contact:

Chris Williams 0417 826 762 email: chris@ambersunalpacas.com

Overseas enquiries welcome

A Tale of Resuscitation... and Constipation...

SOME LESSONS IN NEONATAL CARE

ANIMAL HEALTH AND WELFARE ARTICLE by **Fiona and Ian Vanderbeek** > Birrong Suri Alpacas

I have taken the time to write this tale, and hope you are able to take the time to read it, as there are so many valuable lessons on neonatal care contained therein. Much of what was done for this cria was our standard practice, but with every difficult birth there is so much more to learn...

At lunchtime on 23 October 2006 (four days before the National Show in Canberra) one of our females finally went in to labour, at 373 days. It was her third pregnancy and, though she had never had such a long gestation, it seemed a relatively common occurrence last spring, perhaps due to the prolonged drought. By 4.00pm she had not progressed and was clearly in some distress; I could feel the cria's head, but it was a long way back (my arm was in to the elbow). It was time to call for help and our very experienced alpaca vet arrived by 4.30pm. He confirmed that the head was presented, but the cervix was closed; of particular concern was the lack of movement of the cria when pressure was applied to the nose. It seemed likely that the cria had died, as a result of which full labour had not commenced; hence the closed cervix. Labour was induced with prostaglandin; cortisone was also administered, to assist in final lung development, in the hope that the cria may still be alive. We were warned that the dam was likely to need assistance in delivering "something slimy and dead looking"; the time taken for prostaglandin to work in alpacas is not well documented, but we were told to expect her to deliver in approximately 12 hours.

There followed a night of two-hourly checks. At 2.15am the dam was grazing; at 4.15am she was found with the head and feet visible, but the sac not ruptured. On breaking the membrane the cria was found to be alive and making weak attempts to breathe. A sprint to the house (fortunately only 100 metres from the maternity paddock) to call for help from Ian, followed by a rapid return to the paddock – where the dam was standing, waiting at the gate – she clearly knew she needed help. She lay down quietly, barely needing to be held, while I pulled a large cria that was becomingly increasingly cyanosed (blue from lack of oxygen).

The cria was born at 4.50am, limp and barely breathing. For once a male was not a disappointment – it seemed highly unlikely he was going to survive. Within moments of birth he stopped breathing and while Ian raced back to the house to find the resuscitation mask device we had purchased two years previously, and never used, I held the cria upside down, slapped him on the back, swung him gently from side to side and, in my frustration, shouted at him! The only result was the draining of some white fluid from the lungs; by the time the resuscitation mask was to hand there was still no sign of life. We struggled for a moment to remember how to put the device together and although we had previously been warned that these devices "can cause more harm than good", this seemed clearly a case where we had nothing to lose. After about ten inflations of the lungs the cria was visibly becoming pink and after a few minutes he was breathing on his own. He was, however, very flat and we thought it unlikely he would survive more than perhaps an hour or two.

Our attention now briefly returned to the dam, standing close by, who was given 5ml Engemycin to protect against possible infection after the invasive nature of her delivery.

Resuscitation Mask



Mother and cria were shedded, the cria warmed and dried with a hairdryer and by 5.30am (40 minutes after his birth) he was able to cush. He remained very flat and made no attempt to stand; at 7.00am he was given 50mls glucose (to provide energy) and at 8.00am 40mls Impact (dried colostrum). By 10.45am he managed to stand. At this time an attempt was also made to milk the dam, though her let down had been slow and only 10mls colostrum was obtained and fed to the cria. By this time the cria was hungry and bottle feeding using Biolac was commenced, at one and then two hourly intervals. At 3.45pm the dam's milk was still slow to come and 2mls Oxytocin was administered to assist in let down. By this time the cria was able to walk and was let out of the shed. By 10.45pm the cria had received a total of 640mls of fluid intake, comprising 50mls glucose, 40mls Impact, 40mls of dam's colostrum/milk and 510mls Biolac. He was fed again at 3.30am and 5.30am the next morning and by 8.45am was seen feeding from his dam. He was also given 2gms Protexin at this time to assist in production of gut flora. His birth weight was 9.3kg and he had maintained this weight at 24 hours old.

For the next three days supplementary feeding with Biolac was continued. Although he did now occasionally go under his dam, she showed little interest in him and he spent much of his time cushed in a shelter shed on his own. Initially we were reluctant to feed him too much, hoping that her now full udder and his hunger pangs may unite mother and son. However, as his weight dropped to 8.8kg at two days old and remained the same 24 hours later this strategy was clearly not working. He was, however, feeding well from the bottle and was taking an increasing volume daily (75mls, 100mls and 125mls per feed, totalling 475ml, 600ml and 925ml over the three days).

By 28 October, with the cria now weighing 8.5kg and on two hourly feeds of between 125-150mls at a time, I decided it would be feasible to attend the National Show for one day/night (Ian being already there as Catering Manager), leaving the cria in the care of my in-laws. Although not that experienced, my mother-in-law had previously bottle fed cria under supervision and this boy was hungry and easy to feed. He was still spending his time alone in the shed, either cushed or staring at the wall – it seemed more than likely he had suffered some degree of brain damage following his resuscitation at birth and that this was perhaps the reason his dam took little interest in him. His total intake on that day was 1,140mls.

On the morning of 29 October I received a phone call. The cria was very reluctant to feed and it was difficult to get him to take more than 75mls. It seemed that perhaps nature was taking its course and I returned home by lunchtime to assess the situation – it seemed possible I would need the hole Ian had dug in readiness before leaving for Canberra.



Lazarus – 1 week old

On assessment, the cria had a normal temperature (38.5°) but seemed very quiet, sitting alone in the shed, and was no longer sucking at the bottle. I sat on a bale of hay and simply watched him for a while. He seemed uncomfortable, but it was hard to detect if it was respiratory or abdominal pain.

At 5pm he was given 5ml Tympranyl to give some pain relief and soften bowel contents, together with a Microlax enema. The latter immediately resulted in the expulsion of some impacted pellets. He seemed brighter and took 125mls Biolac. At 7.30pm a second enema was administered and more pellets produced. He was taking the bottle a little better and had achieved a 300g weight increase, to 8.8 kg.

The following morning (30 October) a further 5ml Tympranyl, together with 2g Protexin were given. He was seen briefly feeding from his dam but was still quiet, remaining in the shed, alone. By lunchtime he had become very flat and reluctant to take more than a little glucose or Biolac. We started to wonder if we were simply prolonging the inevitable and arranged to take him in to the vet later that afternoon.

No sooner than his appointment had been made but he ran out of the shed, found his mother and had a short suckle, before cushing next to her under a tree. We cancelled the appointment. He continued to seem a little brighter for the remainder of the day, taking a total of 950mls in addition to occasional feeds from his mother, who now seemed more prepared to take an interest in him. ➤

However, by the next morning he had retreated to 'his shed' where he continued to sit alone. I went out to give him a further 6mls Tympranyl and 2g Protexin. I found him, cushed as usual, next to the largest, hardest lump of impacted pellets I have ever seen; on further inspection, this impaction weighed 30g and was some 80mm long by 25mm in diameter – something the average dog would not be ashamed to produce! By lunchtime he was feeding well from his mother; by evening we could not catch him.

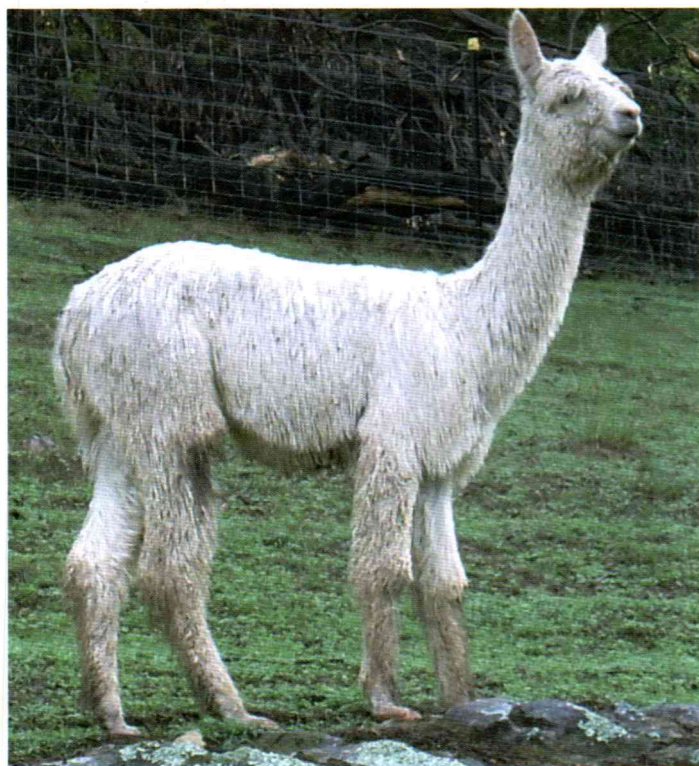
By the following morning (1 November; 8 days old) his weight was 9kg and over the ensuing eight days supplementary feeding was gradually reduced, whilst his weight was monitored daily. By the time supplementary feeding was totally withdrawn, at the age of 16 days, his weight was 11.7kg. He no longer sat alone or appeared in any way brain-damaged, and his dam had become a normally protective mother. On 25 November, at one month old, he was evicted from the maternity paddock when found sitting on a cushed adult, orgling contentedly.

And so, from "something slimy and dead-looking" to a boy who considered himself ready for certification at a month old there could be only one name – Lazarus.

Lazarus has certainly taught us a few lessons and these are summarised below:

Lessons from Lazarus

- > Know when to call for help. If labour is not progressing normally and the situation is beyond your level of competence and confidence – *call the vet immediately*.



Lazarus – 5 months old

- > If you own a resuscitation mask, or plan to buy one, make sure you (a) keep it in your birthing kit, which should be to hand during every delivery and (b) remind yourself at the start of each birthing season how to assemble and use it.
- > Keep a range of commonly needed drugs and feed supplements. Mark the bottles with normal dosages, and be confident in their administration, to avoid errors in times of stress. In this case, other than drugs administered by the vet, we used:
 - (1) Engemycin (antibiotic)
 - (2) Oxytocin (assists in uterine contraction, placental expulsion and milk let down)
 - (3) Protexin (probiotic to assist in establishment of gut flora)
 - (4) Tympranyl (pain relief and softening of bowel contents)
 - (5) Microlax (laxative enema)

Together with the following feed supplements:

- (1) Glucose (a quick energy source)
- (2) Impact (powdered colostrum)
- (3) Milk formula (Biolac, Divetelact, Wombaroo etc)

- > Observe, Observe, Observe! Only while sitting and spending time watching this cria did I really notice that he seemed in discomfort. Think outside the box – initially we assumed this cria's reclusive behaviour was due to brain damage – he was actually severely constipated and in pain.
- > Remember, if food is going in, poo needs to come out!! We always monitor cria carefully to ensure they are seen to perform on the poo pile – if they seem to be straining a Microlax is immediately administered, almost always with instantaneous results. Around 75% of our cria receive a Microlax at between two and five days old; some will need more than one dose.

My mother-in-law's inexperience resulted in her extreme diligence in getting food in one end, without realising nothing was coming out of the other! It may well be that the large volume of formula milk this cria was taking contributed to his initial gut problems.

- > Our standard procedure is to weigh new born cria daily for the first week, then every week for a month and every month until six months of age. This is even more important in an intensive care situation. In our experience bathroom scales are insufficiently accurate and will not measure small weight changes. A set of stock weigh bars which will allow you to measure in increments of 100g are a worthwhile investment.
- Keep detailed records. You will find these notes invaluable, both at the time and for future reference.
- Take photos – we didn't!
- While there's life, there's hope – don't give up! ■

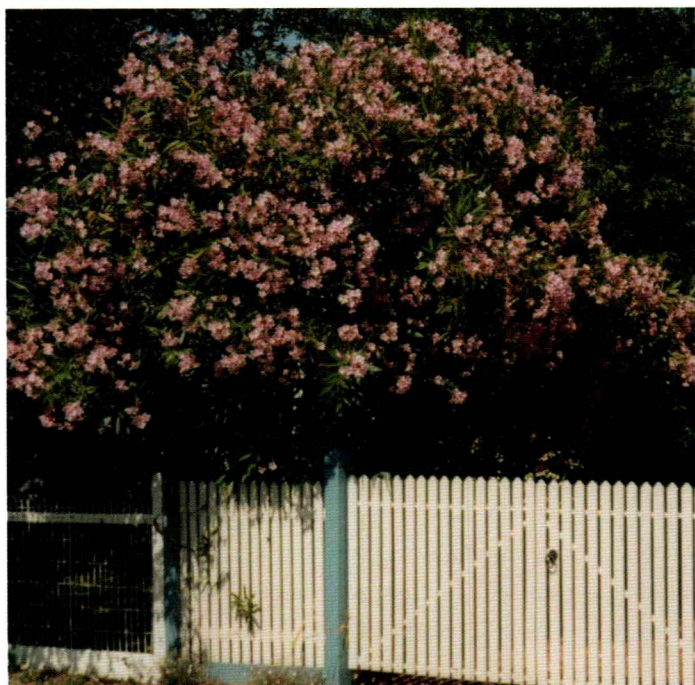


Photo 1 – The common oleander is a popular and hardy garden shrub.

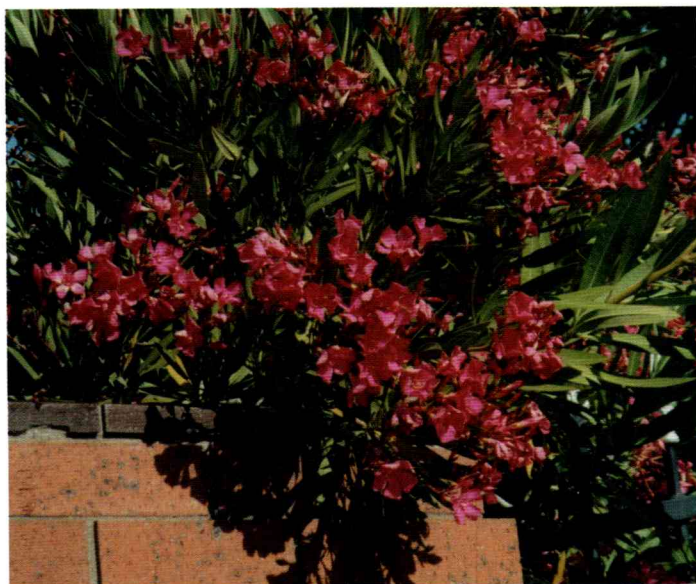


Photo 2 – A striking red oleander. Other colours include apricot and white.

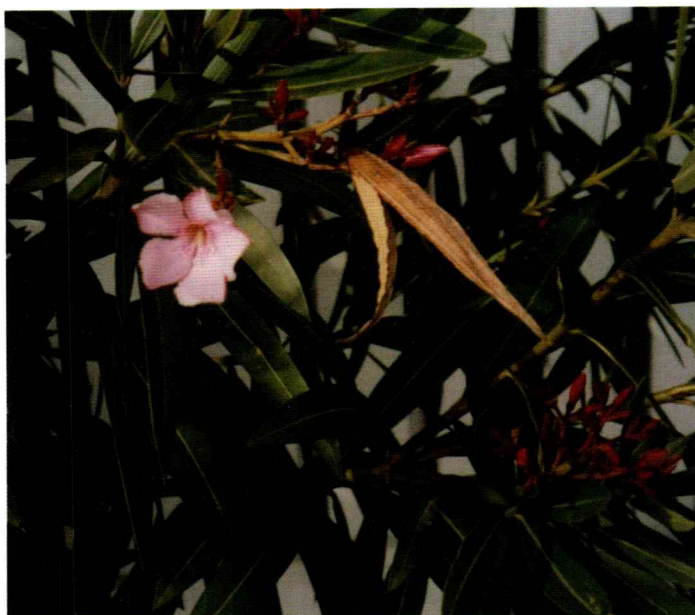


Photo 3 – Detail of flower and old seed pod. Note prominent mid-veins on leaves.

Pink Oleanders, Common Oleanders

A rather untidy, sprawling shrub when left untended, an oleander may grow up to about 4 metres in height and can spread out to several metres across. (See Photo 1) The multiple stems are smooth and greyish in colour. They have pointed leathery, olive green leaves up to 20 cm long, with prominent midribs, and masses of pink, red, apricot or white flowers in spring. (See Photo 2) There are single and double flowered varieties, as well as a variegated leaf form. Single flowered varieties have five petals in clusters at the end of each branch. They flower from spring through to autumn. When flowering is over, the long brown seedpods split open to release many silky-haired seeds, but the pods may stay on the bush until next spring. (See Photo 3)

Oleanders are native to the Mediterranean regions of Africa and Europe, and are adaptable to most soil conditions with a sunny aspect. They make a very popular choice for street and municipal plantings because of the massed colourful effects, and because of their drought hardiness. For these reasons also, and despite their extremely poisonous nature, they are often found in older school plantings. Cutting back makes the shrub sprout faster and flower better the next year. Leaves can sprout from the bare stems.

Toxicity

All parts of the oleander, including the flowers, are extremely toxic, and should be removed from all areas where livestock is being run, including the house garden areas. Boundary fences should also be inspected for possible problems. One oleander leaf or even a flower can be enough to kill an alpaca, and death is usually very quick. Most poisonings have happened when the animals have either reached over the fence, or when garden clippings have been thrown over to them. Several multiple poisonings of alpacas have happened this way, usually of pregnant females being kept in birthing paddocks close to the house. In at least one case, a non-flowering oleander plant went unnoticed when alpacas were introduced to the paddock, with inevitable results.

The wood is toxic, and human poisonings have occurred when sticks of oleander have been used as barbecue skewers. The wood dust is poisonous, and powdered oleander wood was once used as a rat poison. The sap is toxic when ingested and also causes irritant dermatitis on the skin.

Symptoms of poisoning for humans include nausea, vomiting, bloody diarrhoea, sweating, and pupil dilation, followed by heart irregularities, convulsions, respiratory paralysis and death from heart failure.

Poisonous Plant Profile

ANIMAL HEALTH AND WELFARE ARTICLE by **Elizabeth Paul** > Erehwon Alpacas, VIC
> AAA Inc. Animal Health, Husbandry and Welfare Sub-committee member

This series of articles will target those plants that are known to have, or very likely to have caused poisoning in livestock or domestic pets. Most have been shown to be poisonous for humans, but symptoms may be quite different in animals.

Many alpaca breeders and owners on smaller lifestyle blocks like to have their alpacas closer to the house, and lawn areas may provide some useful drought green pick. This will bring them within nibbling distance of a number of common, poisonous garden ornamentals. Larger farms are more likely to have problems with pasture weeds or trees on fence lines, since their alpacas usually have a bigger grazing area away from the house.

There is however, no need for owners to start ripping up their beautiful gardens when they find they have some of the plants mentioned in these articles. Most alpacas will never come into contact with most of these plants.

Common sense should indicate that garden areas, including vegetable patches and herb gardens, are well fenced off from curious alpacas, and climbing or sprawling shrubs should not be allowed to poke through gaps in fences or climb over.

Alpacas should not be tied to fences close to the garden or kept in too small an area where they have little choice of green pick. Shared fence lines should also be inspected for possible problem plants leaning over or dropping leaves or fruits.

A bigger problem is that of throwing garden clippings over the fence with the attitude, "if it's green, they can eat it". This should be a definite no-no, for family members, farm sitters, visiting garden workers, and even neighbours. There have been several reports of alpacas being poisoned this way. Also, wilted or dried plant material can be more toxic than fresh leaves, so garden waste should be bagged, buried or composted. Burning is a less favourable option, remembering that some plants, particularly oleander, give off poisonous smoke as well.

Plants don't have the physical ability to excrete large amounts of toxic waste in the same way that animals can. They may store these wastes in the form of glycosides. These are chemicals containing a sugar group bonded to a non-sugar group, which renders them relatively harmless.

The plant may also actively produce glycosides, as a defence mechanism against browsing animals. Certain enzymes, or an acid environment, such as the stomach, can cause the breakdown of the bonds, releasing the poison.

Examples of glycosides include salicin, from the genus *Salix* (willows), which produces salicylic acid, an analgesic; and the cyanogenic glycosides found in the stones of peaches, plums and almonds, which release hydrogen cyanide.

Some plants even produce poisons against other plants, released from the roots, which gives them more growing space. A plant that does this is called allelopathic in nature.

Remember that plant nurseries in general are most unlikely to carry labels stating certain plants are poisonous, even when they are well known to be (like oleanders). Nursery staff may also not know whether a plant is poisonous, since most glossy plant books and catalogues may not mention that fact either - otherwise they might never sell anything at all!

Oleander - also known as Rose Bay or Rose Laurel

Species Name: *Nerium oleander*
Family: *Apocynaceae*

The plant family *Apocynaceae* is called the dogbane family, with many members coming from tropical or subtropical areas. It contains some of the real nasties of the plant world, with the well known garden shrub, Oleander right at the top of the list.

Other poisonous members of this group include pink periwinkle, a common garden plant; yellow flowered allamandas, sometimes used for hedging in warmer areas; frangipani, and wintersweet, a charming scented shrub with daphne-like pink and white flowers, otherwise known as the poison arrow bush. ➤

Yellow Oleanders

There are about eight *Thevetia* species, or yellow oleanders. They may also be called the daffodil tree, or lucky nut, as the stones are sometimes worn as a good luck charm. However, their other name, the Be-Still tree, might indicate otherwise! Native to tropical America, they are small, evergreen trees which grow to 6 metres in warmer areas, and one is a noxious weed in Queensland. They produce large amounts of milky, poisonous sap when cut. The leaves are glossy green, narrow, long and pointed, with the margins being slightly turned under. The flowers are bright yellow, similar in shape to the pink oleander flowers, although one species has more funnel shaped flowers. (See Photo 4) The flowers may be up to 5 cm in diameter, with a sweet fragrance. The fruit is a berry, green turning red then black when mature. The stone contains two kernels, which are very poisonous. Less than one is enough to kill a young child.

Cattle have died after eating pasture beneath *Thevetia* trees, and the nuts are toxic to chickens. Children have been poisoned after being attracted to the bright yellow flowers or the nuts, and suicidal ingestion is not unknown in certain areas of Sri Lanka. The poison thevetin is a cardiac glycoside, acting directly on the heart.

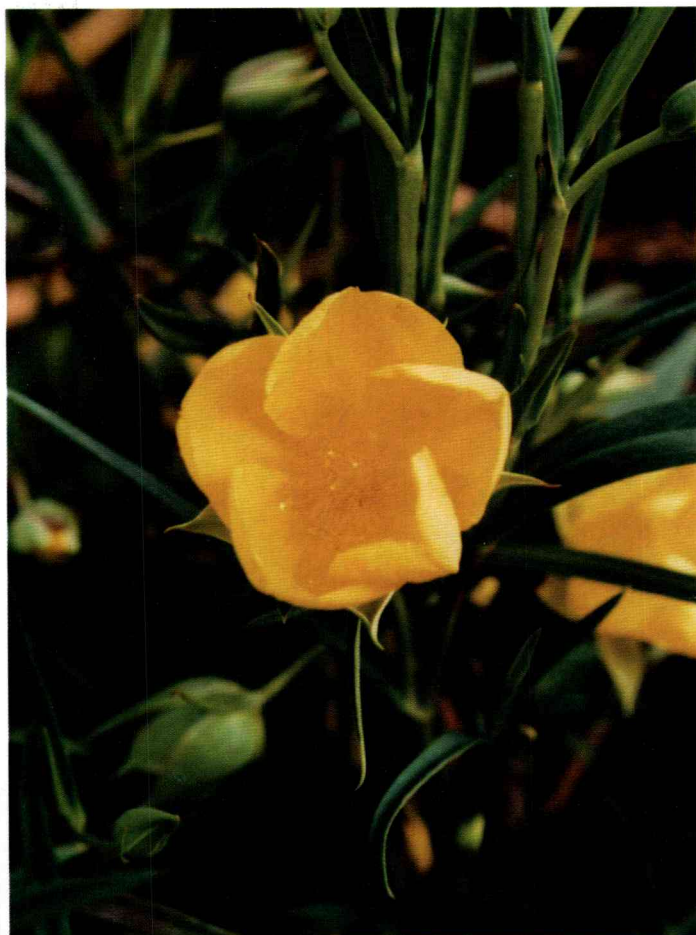


Photo 4 - Yellow Oleander - *Thevetia* sp.

Removal and Disposal

DO NOT BURN OLEANDER - the smoke is toxic.

The only safe methods of disposal are burial, or bagging up for rubbish collection. Oleander clippings should not be put on to the compost heap, mulched, or thrown into any water source. The rootstock will also need to be removed, as it may grow again, but it should not be burned out.

Gloves and even goggles should be worn when handling cut oleander, to avoid getting the sap on the skin or in the eyes. Children especially should be kept away from handling broken leaves, flowers or twigs of oleander.

Similar Shrub

The native kangaroo apple (of the family *Solanaceae*) also has long, dark green pointy leaves and is rather similar in appearance to a small oleander when both are not flowering. However, kangaroo apple has occasional small blue or purple flowers most of the year, and bright green to orange berries hanging down on single stems. It is also poisonous, but not quite as deadly as oleander. ■

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For more information on *Thevetias*:

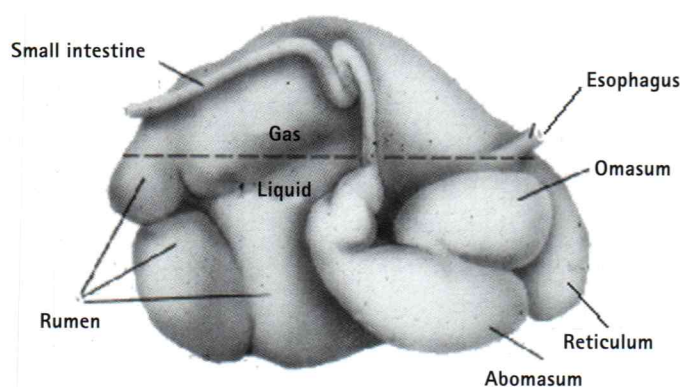
<http://www.inchem.org/documents/pims/plant/thevetia.htm>

Digestive Anatomy in Ruminants

ANIMAL HEALTH AND WELFARE ARTICLE by **Richard A Bowen** DVM, PhD > Colorado State University, USA

Note to reader: *the photos used in this article have been reproduced from the only available materials, most of which were of low resolution. However, we felt that their importance as illustrative content was worth their inclusion.*

The stomach of ruminants has four compartments: the rumen, reticulum, omasum and abomasum, as shown in the following diagram:



The ruminant stomachs, as seen from the right side

Collectively, these organs occupy almost 3/4ths of the abdominal cavity, filling virtually all of the left side and extending significantly into the right. The reticulum lies against the diaphragm and is joined to the rumen by a fold of tissue. The rumen, far and away the largest of the forestomachs, is itself sacculated by muscular pillars into what are called the dorsal, ventral, caudodorsal and caudoventral sacs. In many respects, the reticulum can be considered a 'cranioventral sac' of the rumen; for example, ingesta flows freely between these two organs. The reticulum is connected to the spherical omasum by a short tunnel.

The abomasum is the ruminant's true or glandular stomach. Histologically, it is very similar to the stomach of monogastrics.

The interior of the rumen, reticulum and omasum is covered exclusively with stratified squamous epithelium similar to what is observed in the esophagus. Each of these organs has a very distinctive mucosa structure, although within each organ, some regional variation in morphology is observed (*images below courtesy of Dr. R. Anthony*):



The interior surface of the rumen forms numerous papillae that vary in shape and size from short and pointed to long and foliate.



Reticular epithelium is thrown into folds that form polygonal cells that give it a reticular, honey-combed appearance. Numerous small papillae stud the interior floors of these cells.



The inside of the omasum is thrown into broad longitudinal folds or leaves reminiscent of the pages in a book (a lay term for the omasum is the 'book'). The omasal folds, which in life are packed with finely ground ingesta, have been estimated to represent roughly one-third of the total surface area of the forestomachs.

The anatomic features described above are exemplified by cattle, sheep and goats. Certain other animals are also generally called ruminants, but have slightly different forestomach anatomy. Camelids (camels, llamas, alpacas, vicunas) have a reticulum with areas of gland-like cells, and an omasum that is tubular and almost indistinct. These animals are occasionally referred to as pseudoruminants or as having "three stomachs" rather than four.

A final note on anatomy. Stratified, squamous epithelium such as found in the rumen is not usually considered an absorptive type of epithelium. Ruminal papillae are however very richly vascularized and the abundant volatile fatty acids produced by fermentation are readily absorbed across the epithelium. Venous blood from the forestomachs, as well as the abomasum, carries these absorbed nutrients into the portal vein.

Rumen Physiology and Rumination

The rumen is a fermentation vat par excellence, providing an anaerobic environment, constant temperature and pH, and good mixing. Well-masticated substrates are delivered through the esophagus on a regular schedule, and fermentation products are either absorbed in the rumen itself or flow out for further digestion and absorption downstream. Ruminants evolved to consume and subsist

on roughage - grasses and shrubs built predominantly of cellulose. Despite the fact that some ruminants, feedlot steers for example, are fed large quantities of grain, this section will focus on a ruminant's 'natural diet'.

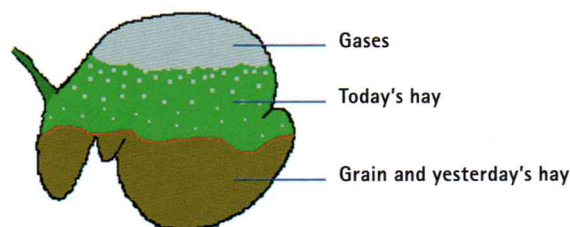
Dynamics of Cranial Digestion

Feed, water and saliva are delivered to the reticulorumen through the esophageal orifice. Heavy objects (grain, rocks, nails) fall into the reticulum, while lighter material (grass, hay) enters the rumen proper. Added to this mixture are voluminous quantities of gas produced during fermentation.

Ruminants produce prodigious quantities of saliva. Published estimates for adult cows are in the range of 100 to 150 litres per day! Aside from its normal lubricating qualities, saliva serves at least two very important functions in the ruminant:

- > provision of fluid for the fermentation vat
- > alkaline buffering - saliva is rich in bicarbonate, which buffers the large quantity of acid produced in the rumen and is probably critical for maintenance of rumen pH.

All these materials within the rumen partition into three primary zones based on their specific gravity. Gas rises to fill the upper regions, grain and fluid-saturated roughage ('yesterday's hay') sink to the bottom, and newly arrived roughage floats in a middle layer.



The rate of flow of solid material through the rumen is quite slow and dependent on its size and density. Water flows through the rumen rapidly and appears to be critical in flushing particulate matter downstream. As fermentation proceeds, feedstuffs are reduced to smaller and smaller sizes and microbes constantly proliferate. Ruminal contractions constantly flush lighter solids back into the rumen. The smaller and more dense material tends to be pushed into the reticulum and cranial sac of the rumen, from which it is ejected with microbe-laden liquid through the reticulo-omasal orifice into the omasum.

The function of the omasum is rather poorly understood. It may function to absorb residual volatile fatty acids and bicarbonate. The tendency is for fluid to pass rapidly through the omasal canal, but for particulate matter to be retained between omasal leaves. Periodic contractions of the omasum knocks flakes of material out of the leaves for passage into the abomasum. ➤

The abomasum is a true, glandular stomach which secretes acid and otherwise functions very similarly to the stomach of a monogastric. One fascinating specialization of this organ relates to its need to process large masses of bacteria. In contrast to the stomach of non-ruminants, the abomasum secretes lysozyme, an enzyme that efficiently breaks down bacterial cell walls.

The processes described above apply to adult ruminants. For the first month or so of life, the ruminant is functionally a monogastric. The forestomachs are formed, but are not yet fully developed. If milk is introduced into such a rumen, it basically rots rather than being fermented. To avoid this problem in such young ruminants, suckling causes a reflex closure of muscular folds that form a channel from the esophageal orifice toward the omasum (the esophageal groove), shunting milk away from the rumen and straight toward the stomach where it can be curdled by rennin and eventually digested enzymatically.

Reticuloruminal Motility

An orderly pattern of ruminal motility is initiated early in life and, except for temporary periods of disruption, persists for the lifetime of the animal. These movements serve to mix the ingesta, aid in eructation of gas, and propel fluid and fermented foodstuffs into the omasum. If motility is suppressed for a significant length of time, ruminal impaction may result.

A cycle of contractions occurs 1 to 3 times per minute. The highest frequency is seen during feeding and the lowest when the animal is resting. Two types of contractions are identified:

- > Primary contractions originate in the reticulum and pass caudally around the rumen. This process involves a wave of contraction followed by a wave of relaxation, so as parts of the rumen are contracting, other sacs are dilating.
- > Secondary contractions occur in only parts of the rumen and are usually associated with eructation.

What about control of rumen motility? The forestomachs possess a rich enteric nervous system, but coordinated contractions require central input. Motility centres in the brainstem control both the rate and strength of contraction via vagal efferents. Cutting the vagus nerve in a ruminant abolishes coordinated reticuloruminal motility. There are also vagal afferents from the rumen to the motility centres which allow stretch receptors and chemoreceptors in the rumen to modulate contractility. Conditions inside the rumen can significantly affect motility. If, for example, ruminal contents become very acidic (as occurs in grain engorgement), motility will essentially cease. Also, the type of diet influences motility: animals on a high roughage diet have a higher frequency of contractions than those on a diet rich in concentrates.

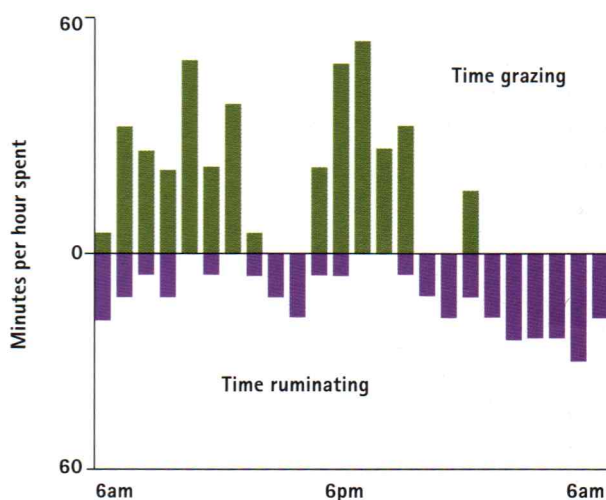
Rumination and Eructation

Ruminants are well known for 'cud chewing'. Rumination is regurgitation of ingesta from the reticulum, followed by remastication and reswallowing. It provides for effective mechanical breakdown of roughage and thereby increases substrate surface area to fermentative microbes.

Regurgitation is initiated with a reticular contraction distinct from the primary contraction. This contraction, in conjunction with relaxation of the distal esophageal sphincter, allows a bolus of ingesta to enter the esophagus.

The bolus is carried into the mouth by reverse peristalsis. The fluid in the bolus is squeezed out with the tongue and reswallowed, and the bolus itself is remasticated, then reswallowed.

Rumination occurs predominantly when the animal is resting and not eating, but that is a considerable fraction of the animal's lifespan. The chart shown here (adapted from Lofgreen et al., J Animal Sci 16:773, 1957) depicts how steers spend their day on an alfalfa pasture relative to time spent grazing and ruminating.



Fermentation in the rumen generates enormous, even frightening, quantities of gas. We're talking about 30-50 litres per hour in adult cattle and about 5 litres per hour in a sheep or goat.

Eructation or belching is how ruminants continually get rid of fermentation gases. As mentioned above, an eructation is associated with almost every secondary ruminal contraction. Eructated gas travels up the esophagus at 160 to 225 cm per second (*Stevens and Sellers, Am J Physiol* 199:598, 1960) and, interestingly, a majority is actually first inspired into the lungs, then expired.

Anything that interferes with eructation is life threatening to the ruminant because the expanding rumen rapidly interferes with breathing. Animals suffering ruminal tympany (bloat) die from asphyxiation.

Nutrient Absorption and Utilization in Ruminants

Volatile fatty acids (VFAs) are produced in large amounts through ruminal fermentation and are of paramount importance in that they provide greater than 70% of the ruminant's energy supply. Virtually all of the acetic, propionic and butyric acids formed in the rumen are absorbed across the ruminal epithelium, from which they are carried by ruminal veins to the portal vein and hence through the liver. Continuous removal of VFAs from the rumen is important not only for distribution, but to prevent excessive and damaging drops in pH of rumen fluid.

The rumen is lined with stratified squamous epithelium similar to skin, which is generally not noted for efficient absorption. Nonetheless, this squamous epithelium has a structure which functions similarly to the columnar epithelium in the small gut and performs efficient absorption of VFAs, as well as lactic acid, electrolytes and water. Recall also, that the epithelial surface is expanded greatly by formation of well-vascularized papillae. It is of considerable practical importance that the size and length of ruminal papillae respond to concentrations of VFAs in the rumen. Animals that have been on a high plane of nutrition, with abundant VFA production, have long, luxuriant papillae well suited to promote absorption. In contrast, animals which have been under nutritional deprivation have small, blunted papillae, and require time on a high quality diet to allow for development of their papillae and absorptive capacity.

All the VFAs appear to be absorbed by the same mechanism, which is diffusion through the epithelium, down a concentration gradient. As they pass through the epithelium, the different VFAs undergo different degrees of metabolism. Acetate and propionate pass through the epithelium largely unchanged, but almost all of the butyric acid is metabolized in the epithelium to beta-hydroxybutyric acid, a type of ketone body

Microscope shot of rumen papillae (sheep)



The three major VFAs absorbed from the rumen have somewhat distinctive metabolic fates:

- > Acetic acid is utilized minimally in the liver, and is oxidized throughout most of the body to generate ATP. Another important use of acetate is as the major source of acetyl CoA for synthesis of lipids.
- > Propionic acid is almost completely removed from portal blood by the liver. Within the liver, propionate serves as a major substrate for gluconeogenesis, which is absolutely critical to the ruminant because almost no glucose reaches the small intestine for absorption.
- > Butyric acid, most of which comes out of the rumen as the ketone beta-hydroxybutyric acid, is oxidized in many tissues for energy production.



Let's put some of the academic information presented here into perspective. The little goat pictured here weighed about 200lb when this picture was taken and produced 1,570kg of milk in a 305 day lactation. Her milk was roughly 4% lactose, 3.5% protein and 3.6% fat. This means that, for the sole task of producing milk, this goat has to synthesize about 250 grams of lactose and 180 grams of protein and 185 grams of fat every day. Essentially all the glucose in that lactose is synthesized in the liver and most of that synthesis is from propionic acid generated by fermentation. Likewise, much of the fat is synthesized from ruminal acetate. When you consider that synthesis of lactose and milk fat are only two of many, many processes that are supported by volatile fatty acids, the process of fermentation in herbivores gains new meaning. ■

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Applying the SRS® Breeding System to Alpacas

RESEARCH AND DEVELOPMENT ARTICLE by **Dr Jim Watts** MVS, PhD > SRS®

The objective of the SRS® breeding system is to increase the density and length of fibres grown by the animal. The system has already been applied successfully to Merino flocks and Angora herds throughout Australia.

I developed the SRS® breeding system for fleece-coated animals between 1986 and 1988. It is based on the pre-papilla cell research of Moore et al (1998). The working hypothesis is that the extent of wool formation and fibre dimensions of an animal are determined genetically by the number and activity of pre-papilla cells in the foetal skin.

The same breeding principles are now being applied to alpacas in Australia and New Zealand. An alpaca that grows more fibres and longer fibres will produce more weight of fleece at a lower fibre diameter. The fibres also become highly aligned and uniform in size and shape. Medullation eventually disappears as the fleece becomes softer, smoother and more lustrous.

Biological principles

To a certain extent, alpacas with high levels of fibre density and length can be identified visually. This is useful, but to go further and reach the very high levels possible, density and length need to be measured. Figure 1 shows a horizontal skin section, as viewed under the microscope, from the midside of a high density alpaca.

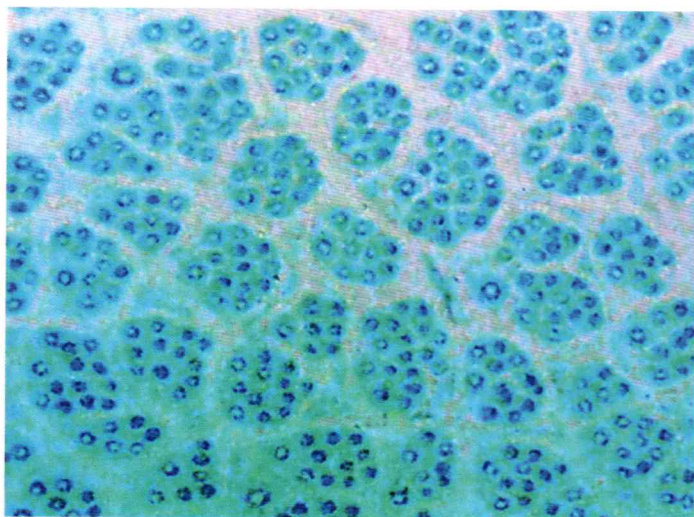


Figure 1. Wool follicles and fibres in the skin of a high density alpaca.

The wool follicles are shown as blue rings and the wool fibres as white dots within the blue rings.

This high density alpaca has 89 wool follicles per square millimetre; a density level about three times higher than that of the average alpaca. Note how uniform and fine in diameter the fibres are. None of the fibres appear to be medullated. The fibres are also distinctly circular in cross-section.

High density aligns the fibres in the fleece and reduces the scale height on the outer surfaces of the fibres so that the fibres have a smooth feel. If the fibres are also fast growing (long), these smooth scales will also be long scales with fewer contact points with the wearer's skin.

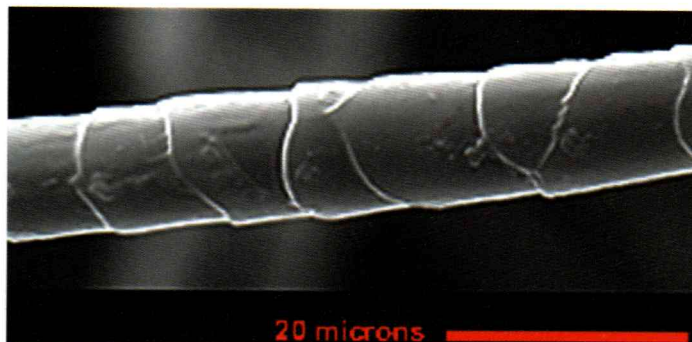
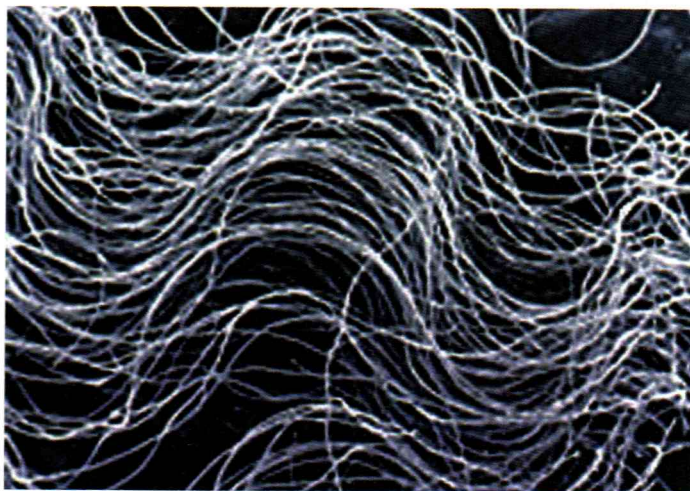


Figure 2. Scanning electron micrograph from a high density and length animal reveal that the fibres are highly aligned (top), uniformly sized and deeply crimped (top) and cylindrical in shape with smooth surfaces created by long, flat scales (bottom).

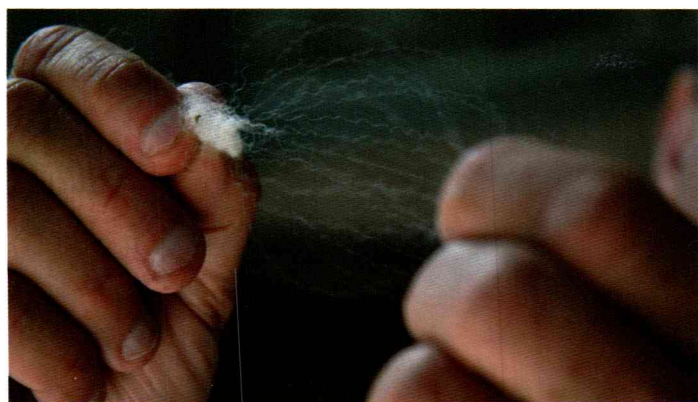


Figure 3. A quick test for fibre uniformity and elasticity



Figure 4. This alpaca has a high density of 61 fibres per square millimetre. The fibres are 18.0 microns in mean diameter and grow at the rate of 0.39 millimetres per day. The average alpaca has a density of about 30 fibres per square millimetre and a fibre length of about 0.30 millimetres per day.

High density also imparts high elasticity to the fibre. Note in Figure 3 that fibres withdrawn from the staple of an alpaca with high density and length can be easily stretched and when relaxed, resume their normal shape, revealing the deep crimp and symmetry of each fibre. There is no guard hair present as the primary fibres are very fine.

Alpaca fleeces with high fibre density and length consist of long and thin staples of high crimp amplitude (deep crimp) and often low crimp frequency (bold crimp). The wool is very soft and lustrous (Figure 4).

Achievable Goals

Bred in this way, the alpaca has the potential to produce a fibre that is highly prestigious and valuable and potentially well-positioned for luxury retail markets. An increasing number of Australian alpacas with high densities like the one shown in Figure 4 and exceptional fibre length of 0.40 to 0.60 millimetres per day, are being identified at my laboratory.

So it is possible to breed alpacas with at least double the fibre density and double the fibre length of current industry levels. If this was done, the alpaca would change from producing about 3 kilograms of 25 micron wool to one producing about 7.6 kilograms of 20 micron wool or 4.3 kilograms of 15 micron wool.

Reference: Moore, G.P.M., N. Jackson. K. Isaacs and G. Brown (1998). J. theor. Biol. 191, 87-94.

A Breeder's Perspective on SRS®

INDUSTRY ARTICLE by **Jeffrey Farman** > Flowerdale Estate Alpacas, VIC

These are really exciting times for Australian alpaca breeders. To think that within a few short generations of selective breeding using the SRS® system we could produce animals that are moving towards a doubling of fleece output that is finer and more lustrous than previously known, is enormously encouraging.

Some alpaca breeders, who have been using the system for a few years and have up to three generations of animals bred for density and length, are seeing a progressive and measurable improvement. These alpacas are already more than twice the density of good alpacas in the Australian herd. The identification of such animals and the application of their genetics in future breeding programs, given the highly heritable nature of these traits provide a faster route to achieving the goals of increased fleece weights and finer fleeces.

That's why, two years ago, a few of us got together with Dr Jim Watts to invest in the establishment of an organisation to implement the SRS® breeding objectives for the alpaca industry. A corporate structure is now in place that has as its fundamental aim, the delivery of SRS® principles and technology to interested alpaca breeders and the protection of the intellectual property of SRS® on an international basis.

New Company formed

Last year, a company was formed to license the international rights to the SRS® Breeding System for all matters related to the breeding of alpacas. The new company is SRS® Alpacas International Pty Ltd (SRSAI). The office is in Melbourne with Sue Northfield, alpaca breeder and an SRS® member, as its administrator. ►

Currently, around 80 members belong to a subsidiary organisation, SRS® Alpacas Australia (SRSA). SRSAI undertakes to deliver all the services and information required by SRSA for the application of the SRS® breeding system to alpacas. These include breeding consultations and reports, joining strategies, maintenance of a list of males recommended for an SRS® Breeding Program, skin biopsy analyses and reports, workshops and an annual conference. These services can be requested through the SRSA office.

Benefits of membership apply to all members and only members. Members of SRSA have exclusive access to SRS® classers and breeding consultants, trained by Dr Watts. Some members have already had males assessed by Dr Watts and his consultants. Those that have met the prescribed criteria, and been found to be suitable, have been nominated for use in the SRS® breeding system. All have achieved the high standard set to be on the official Recommended List that can be viewed at www.srsalpaca.com. A 10% discount on advertised service fees for all SRS® males is available to members of SRSA.

In the future, members will have the ability to advertise sales and services on this dedicated SRSAI website. There is a member's forum on the website for ongoing discussion and education. Members also have preferred access to SRS® seminars and Open Days.

SRSA now has members in New Zealand, USA and the UK and currently has enquiries from Canada. In time it is envisaged that SRSAI will operate in other countries. Overseas breeders are now able to join SRSA for the same subscription as Australian members, with full member rights.



Members' Conference

In 2006, a very successful conference was held at Riverina TAFE in Wagga Wagga. This year's conference will be held at the same venue on August 21 and 22. There will be an informative program for the members with hands on tuition using fleeces and live animals. Dr Jim Watts will be the main presenter with other industry participants. Preliminary details are now on the website.

New members are welcome. Full details on membership are available on the website. ■

AANZ Alpaca Conference

ALPACA ASSOCIATION
NEW ZEALAND



The Alpaca Enigma

Mark these important dates in your diaries:
Saturday 30 June and Sunday 1 July 2007

Come and find out about **The Alpaca Enigma** at the 2007 AANZ Alpaca Conference to be held in Dunedin, New Zealand. Guest speakers will include David Anderson, Pierre Baychelier and Andrew and Christina Dart

Or why not make it a long weekend and take advantage of our fantastic Dunedin hospitality with farm visits on 29 June and workshops on 2 July.

For more information, regular updates and online registration visit our web site at
www.alpacaconference.co.nz

or contact the AANZ office at PO Box 6348, Christchurch, New Zealand
Ph: +64 3 341 5242

"The Alpaca Enigma"

The AANZ Annual Conference 2007

EDUCATION ARTICLE by **Andy Nailard** > Conference Working Group

The Alpaca Association of New Zealand (AANZ) will hold its Annual Conference at the Dunedin Centre, Dunedin, New Zealand on Friday 29 June through to Monday 2 July 2007. Running concurrently, and at the same venue, will be the Camelid Veterinary Conference, hosted by the Camelid Section of the New Zealand Veterinary Association (NZVA). A number of speakers will be presenting at both conferences.

The theme for the Conference is "The Alpaca Enigma".
As the Conference website declares:

"Ask alpaca owners what first attracted them to these wonderful animals and there will be almost as many reasons as there are alpacas! However, analyse these reasons and there appears to be one overwhelming connecting factor about the animals themselves, which in itself is very difficult to quantify. This is 'The Alpaca Enigma'. We do not promise that the Conference will unravel this enigma, but it is our aim to remove the exclusivity of knowledge by providing both the diversity and insight that will satisfy all owners irrespective of their individual areas of interest."

David Anderson, from North America, will lead the speakers. He formed the International Camelid Institute which promotes education, service and collaboration among researchers, breeders, owners, fibre and textile industry professionals and animal enthusiasts worldwide.

Further details of the speakers will be made available on our Conference website at www.alpacaconference.co.nz as they are confirmed but they already include:

- > Christina and Andrew Dart, both of whom are familiar to the Australian alpaca industry as specialists in alpaca anaesthesia and surgery respectively.
- > Pierre Baychelier, who will introduce and expand on his research presented at the 2006 Adelaide AAA Conference and will also talk about his love for the suri alpaca.

- > Dr. George Davis should need no introduction to most alpaca breeders. He is based 'over the hill' from the Dunedin Centre, and will look at the correlation between alpaca and other livestock research in New Zealand.
- > David Musgrave, an organic farmer and flax-seed specialist who will examine strategies for getting the best from any paddock and ultimately from our animals.
- > Colin Mackintosh is one of the fathers of Tb testing protocols and will offer fresh insight into tuberculosis and the progress that has been made on addressing this disease in livestock.

Do come and join us in Dunedin for the AANZ Alpaca Conference 2007. Freedom Air, a budget airline subsidiary of Air New Zealand, operates non-stop flights from Sydney and Brisbane to Dunedin and there are also regular services through Christchurch, itself a hub for Australia/New Zealand airline services.

For further details visit the Conference website at www.alpacaconference.co.nz

or contact the AANZ office at:

AANZ,
PO Box 6348,
Upper Riccarton, Christchurch,
New Zealand;
Tel: +64 3 341 5242
Website: www.alpaca.org.nz

See you in June! ■

Priscilla, Queen of the Alpacas

INDUSTRY ARTICLE by **Margaret Binks** > Pentland Alpaca Stud, WA

"We've all heard of Priscilla, Queen of the Desert, now there's Priscilla, Queen of the Alpacas", were the opening words of the news item that appeared in the *Albany Weekender* in November 2006.

Photography by Debbie Maddams



Priscilla with her newborn alpaca cria ...



... with cria at 2 days old



... with cria at 3 months old

Well, this Priscilla is neither a desert camel nor an alpaca, but she has made news because she is a llama who has given birth to an alpaca cria, and there was probably no-one more surprised than she at what she delivered.

Pentland Alpaca Stud had had a little dabble in ET in June 2005, and decided to do another session in December 2005, but our problem was an insufficient number of recipient females at our disposal.

As Laurie and I are trying to down-size rather than increase our herd size, we did not want to buy up females from elsewhere, but we did need to have a suitable number of recipients to make the ET program worthwhile. We only planned to use three donor females, multi-ovulated, so the recipient females needed to total about ten.

As we had two female llamas on our tourist farm, and they were not being used for breeding, we began to wonder whether they could be used in an alpaca ET program.

Dr Jane Vaughan was duly consulted, and she said that although it had not been done in Australia, there was a breeder doing it in the US with great success, so we decided that our emergency recipients would be the llamas.

As the llamas are just used as a tourist attraction, they had not been handled much at all, so there was a bit of a circus when it came time to give injections in the lead up to the program.

But the funniest part of all was when we had to spit off all the recipient females and only had alpaca males to use over the llamas. None of our males are very big, and even though they were very willing to 'have a go', the llamas treated them with utter disdain (and it is amazing how big a llama's spit is!).

So when the day came for Jane to flush and implant, we were not 100% sure of the state of the llamas. However, Jane's hi-tech ultrasound soon showed us that all was well, and two alpaca embryos were duly implanted into the two llamas.

The next challenge came when we scanned at 60 days – the vet had never scanned a llama before, and we had to bring them to the shed and hold them securely!

The ultrasound showed a beautiful picture of a pregnant uterus complete with embryo on the first llama, but we could not pick up the uterus at all on the second llama, so we deemed that we had one pregnant, and one empty. But then as the vet was leaving, he said to us, "Don't necessarily discount the second llama, as it was not very easy to find where everything was in her!"

As the months went by, we really felt that No. 2 was possibly pregnant, and in the last months, Laurie was able to palpate them both (with some difficulty), and was fairly confident that both were pregnant.

As the date approached for the birthing, we started to get apprehensive about it all – not aided by all the helpful comments from friends and visitors ...

"Will you have to catch it as it is born?"

"Will the long drop hurt it?"

"Will it need a step-ladder to feed?"

And then Priscilla chose Albany Show time to give birth, when Laurie and I were not even there! Our daughter, Deb rang us at the Show to tell us the news – Priscilla had a pure white female alpaca cria, and all was well.

She took a photo at about 5 minutes of age to show us, and we're sure Priscilla was saying that that was the easiest birth ever, but what on earth is it!

Deb gave the cria some colostrum and she weighed in at 8.5 kgs, so it was a good healthy start. When we got back home later that day, Priscilla was being very protective, and always trying to stand between us and the baby.

Today the baby is three months old and really thriving, but Priscilla still doesn't like us too near her. All through the summer we had them both in our 'hands-on' paddock along with other alpaca mums and babies, and Priscilla soon learned that visitors arrived with food, so she would be to the forefront to eat, and certainly ruled the roost!

But we did get some funny comments – after all these years of having people call our alpacas 'llamas', now no-one seemed to know what the 'big animal' was.

And one of the best comments of all was the very concerned ex-farmer who came back up to the on-farm shop to tell us that one of our little alpaca babies was trying to suckle from that big brown animal! ■



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- mandatory parent verification by DNA
- mandatory permanent identification
- adoption of a Breed Standard
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If you would like to contact one of the many active breeders in Canada, need a membership application form, or are simply interested in obtaining more information, please contact the CLAA office at:

1-800-717-5262

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SUPPORTING THE PROGRESS OF THE ALPACA
INDUSTRY THROUGH ACCURATE KNOWLEDGE
OF PEDIGREE AND PERFORMANCE**

Homozygous Suris: What are the Odds?

A SURI BREEDER'S GUIDE TO PROBABILITY

SURI ARTICLE by **Kenneth E. Madl** > Aviana Farms Ltd., USA

"In animal breeding there is just now starting the same revolution in methods that was in full activity about 1910 in plant breeding. We are fighting conservatism and ignorance, especially among the men who have been looked up to as authorities in these matters. We have to help the breeders to discard some of the same wasteful and stupid methods that the old school of plant breeding used." Dr. A. L. Hagedoorn, "*Animal Breeding*", 1939

In 1997 Dr Raul W Ponzoni of the South Australian Research and Development Institute released his paper titled, "*Phenotypes Resulting From Huacaya by Huacaya, Suri by Huacaya and Suri by Suri Alpaca Crossings*", stunning the alpaca industry.

He wrote it together with DJ Hubbard, RV Kenyon, CD Tuckwell, BA McGregor, and GJ Judson, and made the amazing claim that, "The results indicated control by a single gene (or by an haplotype), and dominance of the allele responsible for the suri type (*AlFs*) over that responsible for the huacaya type (*AlFh*)."

In other words, suri fleece type was dominant in alpacas. Up until that time, it was the widely held belief that the huacaya fleece type was dominant over the suri fleece type. How else to explain the fact that there were about ten to twenty times as many huacaya alpacas in the world than suris? (In his paper, Dr Ponzoni believed suris to comprise 10% of the alpaca population; others believe it to be only 5%.) If the suri allele is dominant, why weren't there more suris? Could Dr Ponzoni really be serious?

We know now that with their exposed backlines, suris are more at risk to weather conditions in the high Andes. Their fiber is also more difficult to process, thus making them less desirable to native breeders. We also know that unlike dog breeds, when suris and huacayas are mated together, their fleece types remain distinct.

In "*Animal Breeding and Production of American Camelids*", Rigoberto Calle Escobar wrote, "Notwithstanding the fact that the Suri and Huacaya varieties have been bred in complete promiscuity for several centuries, it is true that each has kept its ethnic features perfectly defined and differentiated.

Barreda rightly says "that it is a real miracle" that the ethnic features are still presented for both varieties, when from remote epochs, and even to date, both have been bred mixed and together. This type of breeding can still be seen today in alpaca raising in farms that are relatively advanced in Puno, Peru."

Before he died, Don Julio Barreda realized that it was not a miracle, but simply a matter of genetics. In the Introduction to "*The Alpaca Colour Key*", Elizabeth Paul described how she used a fluorescent phase microscope at the Dept. of Biotechnology and Environmental Biology at RMIT University for pigment studies, and concluded that "Suri and huacaya alpacas are two fleece forms of the same animal; there is no difference as far as colour genetics is concerned".

Reinforcing Dr Ponzoni's conclusion of a single gene governing alpaca fleece TYPE is a passage by Prof Jay L Lush, from "*The Genetics of Population*": "Natural selection will surely have favored the simpler and less vulnerable pathways. ... These considerations make it not surprising that many of the characters which show a clear-cut monofactorial Mendelism are minor external details of color or conformation ..."

To illustrate how the alleles work in practice, the best way is to use a Punnett Square. If we assume that there is an allele for suri fleece that is dominant, it would be shown as "S". The recessive huacaya gene would normally be shown as "s", but to help clarify how the alleles interact, I will label it as "h". In "*Basic Genetics For Camelid Breeders*", Dr George Saperstein wrote that, "A dominant trait will be expressed when the offspring inherits one or two dominant genes in a pair. A recessive trait will only be expressed when the offspring inherits both recessive genes."

The following Punnett Square shows all the possible ways the four alleles could combine if a homozygous suri male were mated to a huacaya:

		Huacaya female (hh)	
		h	h
Suri male (SS)	S	Suri Cria (Sh)	Suri Cria (Sh)
	S	Suri Cria (Sh)	Suri Cria (Sh)

A heterozygous suri male mated to a huacaya produces a different set of probabilities:

		Huacaya female (hh)	
		h	h
Suri male (Sh)	S	Suri Cria (Sh)	Suri Cria (Sh)
	h	Huacaya Cria (hh)	Huacaya Cria (hh)

We need to define some terms; Dr Wayne C Jarvis presented a simple explanation of the basic concept we are dealing with in “Genetics 101”: “when the alleles are the same, this condition is called **homozygous**. When the alleles are different, it is called **heterozygous**.”

In “Understanding Animal Breeding”, Richard M Bourdon writes that historically the term “F₁ referred to the first cross of two purebred populations. More recently, it has taken on a broader meaning, signifying the first cross of two unrelated populations whether they are purebred or not.”

So with regard to suris, a progeny from a suri and a huacaya is an F₁. It is now generally accepted that an F₁ mated to another F₁ will produce an F₂ offspring, even if they are not brother and sister. In the first example above, all possible outcomes result in a phenotypical suri cria, and all would be considered to be F₁s, while the second example shows that the odds are 50% of producing an F₁ suri, and 50% of producing a huacaya.

Dr Andy Merriwether wrote on an alpaca forum about F₁ suris: “Suris out of suri-huacaya crosses are very variable and you cannot make any assumptions at all about what kinds of fleece they will have. Some have taken championships.

They are no different whatsoever genetically from any other heterozygote suri, of which a large percentage of the US herd already is.”

We know that many of the suris exported to both Australia and North America, especially the colored suris, were a result of just such a mating. So what happens when these alpacas arrive in their new homes, and are mated to other heterozygous suris? This explains the possibilities:

		Suri female (Sh)	
		S	h
Suri male (Sh)	S	Suri Cria (SS)	Suri Cria (Sh)
	h	Suri Cria (Sh)	Huacaya Cria (hh)

It shows that there is a 25% chance of producing a homozygous suri cria, a 50% chance of producing another heterozygous suri cria, and a 25% chance of producing a huacaya.

“Backcrossing” is defined by Prof. Bourdon as “The mating of a hybrid to a purebred of a parent breed or line”. To increase the number of homozygous suris, alpaca breeders should plan to mate their heterozygous suri females to a known homozygous suri male. The progeny would be a BC₁. This Punnett Square illustrates the possible outcomes:

		Suri female (Sh)	
		h	h
Suri male (SS)	S	Suri Cria (SS)	Suri Cria (Sh)
	S	Suri Cria (SS)	Suri Cria (Sh)

It shows that the progeny would be a phenotypical suri, but the odds are 50% that it would be homozygous, and 50% that it would be heterozygous. The last two examples, taken together, show that anytime you mate two suris together and produce a huacaya cria, both the male and female are heterozygous. Only the recessive huacaya allele from each could combine to create a huacaya fleece.

Conversely, two huacayas mated together can only produce a huacaya. The very few examples of suris out of two huacayas reported in the Australian and North American registers have been proven to be recording errors. ➤

Alpaca – the Golden Fleece for Peru and Australia

FLEECE ARTICLE by **Dr Nicholas Baker** > Austrade Lima, Peru

Alonso Burgos looked shaken and pale. A fire had broken out the night before on Pacamarca, the alpaca research centre near Peru's legendary Lake Titicaca. Fortunately the damage had not been as extensive as first thought.

"Altogether we lost some 450 hectares of natural grassland, which means that we will not have enough food to feed our animals until the rains arrive, but nobody was hurt," said Burgos.

"A group of four very poor peasant families, wrongly advised by an unscrupulous local attorney, set fire to a portion of grass and, given the dry conditions at this time of the year, the fire extended rapidly to different areas of our property", he added.



This incident illustrates the sensitive nature of alpaca breeding in Peru. The introduction of overseas technology and innovation is often viewed with suspicion, with locals fearing that these modern developments will take away their livelihood.

Australian breeders are now doing the unthinkable in many ways – exporting alpaca to its birthplace, Peru. While this is a great "coals to Newcastle" story, the perception of small communities in Peru, which have tended these animals for centuries and regard them as their heritage, is not always positive.

Burgos, who manages Pacamarca for Grupo Inca, the country's leading producer of alpaca fibre, explains that Peruvian alpaca farmers can only benefit from outside expertise but convincing them of this is difficult.

"We need to improve the quality of the herds," he said. "We need to increase the yield of quality fleece and we need to develop a reliable registry of animals."

Demand has never been greater according to Burgos, with Grupo Inca struggling to meet increased orders from Asia and Europe for high quality alpaca fibre. The company is determined to develop a strategy to increase production and grow the market.

Grupo Inca is no stranger to Australia, having established close ties with breeders and researchers Down Under.

Burgos recalls a visit to Australia organised by the Australian Alpaca Breeders Association, the Council on Australian Latin American Relations (COALAR), Austrade and the Peruvian Embassy in Canberra where he accompanied a Peruvian breeder. The breeder only spoke Quechua, an indigenous language, and had never traveled beyond his region before.

"The trip totally opened his eyes," said Burgos. The breeder saw alpacas clipped with electric shears for the first time. He was shown software for managing herds and tracking breeding cycles, and he was able to see first hand what Australian breeders had managed to accomplish in a very short time with animals imported from Peru. (Austrade had been instrumental in negotiating with the Peruvian sanitary authority, SENASA to allow these initial animals to leave the country.)

Four years later, Grupo Inca is now importing fibre from these same beasts back to Peru.

Pacamarca, which means "place of the alpaca" in the Quechua and Aymara languages, is home to 1,751 animals, an impressive increase on the 300 they began with when the centre opened almost seven years ago.

Burgos reports that the average fertility rate of alpacas is 40%. At Pacamarca it is 85%. The average mortality rate for alpacas is 40%. At Pacamarca, the rate is down to 7%.

The animals are fed a highly nutritional diet, they receive gynaecological attention including ultrasounds, they are groomed and some are even treated to aromatherapy sessions. Pacamarca, at 4,060m above sea level can get down to 15 degrees below C in winter, so they are provided with coats (which are not alpaca!).

Grupo Inca's achievements at Pacamarca have yet to have an impact on the majority of Peru's 3 million alpacas. Although home to the largest alpaca population in the world, Peru only produces 5,000 tonnes of fibre per year, 50% of which is unsuitable for use in the textile industry.



Pacamarca, the alpaca research centre near Peru's legendary Lake Titicaca

Pacamarca is Peru's only centre for genetic research for alpacas but its budget is restricted by the commercial realities of the industry.

Australian universities have led the way in animal genetics, and it is this very expertise which Peru needs. Burgos says that having scientists from Australia spend time working with and teaching staff at Pacamarca would be invaluable. However, costs are a major consideration. One Australian genetics expert approached by Burgos quoted a fee of \$AUD 100,000 to produce a programme for Pacamarca, a figure which is beyond their reach.

"Traditional genetics put the accent on breeding large animals with a high density of fibre, sacrificing the quality of the fleece. We are looking to improve the quality of the fibre," said Burgos.

Ideally, the centre wants to encourage Australian researchers to come to Peru as part of an exchange and work side by side with locals at Pacamarca. Another idea is to establish a foundation with the help of Australian and Peruvian businesses, government allies, breeders and the agricultural faculties of Australian universities.

Austrade Lima is working to facilitate further cooperation between Australian alpaca breeders and their Peruvian counterparts. Protocols are now in place for the importation of scoured alpaca fibre from Australia, which will then be made into high-end garments in Peru for export.

The export of Australian alpaca genetics to Peru, such as semen and embryos, would further strengthen ties that bind these close-knit communities. ■



Pastors viewing the ultrasound



Shearing demonstration

The Empty Chair

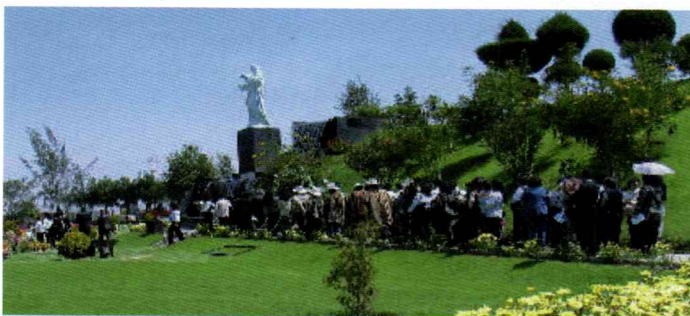
INDUSTRY ARTICLE by **Mike Safley** > Northwest Alpacas, USA

Ed: Upon his death in 2006, Don Julio Barreda was described by Mike Safley as "a giant in the alpaca world - the Godfather" in the eulogy published in *Alpacas Australia* (Issue 50 - Winter 2006)

A light rain fell as we forded the river on our way to Macusani from Nunoa. It was exactly a year since I last visited Don Julio Barreda at Accoyo in November 2005. The rain turned to hail as we approached the white stucco casa; Elena was there to greet us. On the entry table lay his Gucci sunglasses, alpaca knit cap, and scarf. The table was set for five: bread, cheese, olives, alpaca meat sandwiches, and coca tea. The room was exactly as it was one year ago with pictures of heroes and villains on the wall. And just as I had during fifteen years of visits to Accoyo, I learned.

We began to talk – Elena, Elena's sister Lupe, and me. With help from Shinnny, an East Indian nun who works with Quechua Benefit, we overcame the language barrier and made small talk. I asked about the family. "They are all well," Elena said, but the room was full of heavy hearts. We needed to cry and we did at the first mention of Don Julio's passing. Elena said, "It was his heart." But I knew his heart was strong – it created and endured for eighty-seven years. It was just time to go to the other side.

He was gone with almost no warning, and Elena, who had spent her entire life in admiration, love, and service to Don Julio, wanted to die. The funeral, the reception eight days later, along with the delegation from the municipality of Macusani, children from the Mosque Runa Orphanage, Dr. Willy representing Quechua Benefit, alpaca criadores, and countless friends and family left Elena overwhelmed and conflicted. Don Julio made no secret of the fact that he always wanted a son. But not long before he died, he brought his four daughters together to tell them how, later in life, he "thanked God that he had four daughters instead." Elena asked herself, "What would Poppi want?" And in that instant, she knew that he would want her to continue the work of Accoyo. It's a reason to live, she thought.



The funeral procession at Don Julio's burial

Uninvited, lawyers began calling the home in Arequipa, volunteering to help the sisters sell Accoyo and divide the proceeds. Mosies, Accoyo's lead criador, called from Macusani to say that six men had appeared, with guns raised, to steal fourteen Plantel machos. They chose the best, and Elena was devastated.

Under siege, the family needed to act or Accoyo would slip away. They came together and made a pact. The Barreda sisters would keep the ranch intact until the last one died. Elena, who had spent a lifetime learning Don Julio's philosophy of alpaca breeding, committed to teach each of the sisters what she had learned. The entire family, including the grandchildren, would begin to operate Accoyo.

With Don Julio's voice in her ear, Elena left for Macusani to investigate the theft. She soon learned that the police weren't interested in alpaca rustlers. Elena questioned the witnesses and asked herself what Don Julio would do. A voice told Elena to contact the *rondas*.

Many years ago, acting as mayor of Macusani during the time of the Shining Path, Julio Barreda realized that the townspeople needed to mount a civil militia; a tactic he knew was effective in other parts of Peru. Each of the larger farms was asked to contribute several men to participate in monthly meetings, communications training, and patrols. Each farm would also supply food and support. They were only lightly armed but observant, keeping a lookout for the thievery that was a bigger problem than terrorists in that remote area of Macusani. The *rondas*, as the militia was called, remained vigilant and successfully defended the local farms.



The four sisters (front row) at Don Julio's funeral. Elena is second from left.

Don Julio couldn't have known that his effort decades earlier would help his family after his death. Elena listened to her father's advice and turned to the *rondas* for help. The response was immediate; the men of the local militia tracked the machos to Sicuani, a town not far from Cuzco. A witness identified the thieves, but the local police refused to act. Confronted at gun point by the local men from Macusani, the thieves gave up the Plantel machos, each and every one. This small success restored the family's optimism.

We finished the last sandwiches, and Elena asked if we would like to visit the paddocks to see the machos. As we made our way up the hill to the alpacas, it seemed as if nothing had changed. The cowboys beamed with pride, and Elena asked them to catch a select group. I asked about the size of the current herd. "We have 1500-1600 alpacas, 40% suri and 60% huacaya," said Elena – the same as always.

We reminisced about Don Julio and his vision for alpacas, and I asked about the 20/20 animals that had been Don Julio's passion.

"We have them," said Elena.

"May I see?"

"Of course," she said, and asked Moises to catch Baltazhar, an impressive animal who was not too big but had fleece as thick as any I have seen.

"How many pounds did he cut?" I asked.

"Twenty-two pounds!"

"Is he the heaviest cutter you have?"

"No, we have Tobayu."

As Tobayu was caught I asked again, "How much?"

"Twenty-four pounds," said Elena. She told me that her father had read Charles Massey's book, *Merino*, and had seen a ram who sheared fifty-five pounds of wool.

"We can create an alpaca like this," he said. Who among us can argue with Don Julio?

Elena brought in a group of suris as I chatted with Lupe.

"Did you know that Don Julio had a son?" she asked.

"No!" I said, surprised. In fifteen years of friendship Don Julio had never mentioned a son.

"Do you see the building on the side of the hill, the one with the metal roof and the courtyard fence?"

"Yes," I answered, realizing I had often wondered if a criador's family lived there but had never asked.

"He is buried there. He died at eleven years of age. His name was Jose Francis," said Lupe.

The males kept parading into the rock corrals just as they did on every visit, and I asked Elena if Don Julio had any new dreams for the alpacas before he left. Yes, she said, he had a vision for "white vicuña" with fleece finer than any of the "B" line Accoyo. I recalled that Don Julio believed that there could be many breeds of alpaca. He had already developed his "A" line, or dense breed, and a "B" line, or fine breed, but I had never heard the term "white vicuña." Today Elena, with "Poppi" speaking softly in her ear, is hard at work on the dream. She showed me several examples with fleece so fine my ageing eyes could only guess their micron count – well below sixteen, I am sure.

We made our way back to the house, down the hills made platinum by the recent hailstorm. Our breath clouded the path. I couldn't help but think that Accoyo is alive and well. As we entered the dining room, we saw that the table was again loaded with food – pasta, olives, bread, and lamb piled high. Lupe asked me if I knew who was in the photo above the credenza where Don Julio always sat. No, I said, realizing that I had never noticed the five by seven, black and white photo before. It was a baby picture. "That was Jose Francis," said Lupe. "He died in 1954."

I glanced at the picture and then at the empty chair where Don Julio always sat. I thought for a moment. Julio is there. As I shared my thoughts with Elena and Lupe, they said, "No one but Don Julio will ever sit in the chair at the head of the table." Yes, he is right there, in everyone's mind and memory – not very far at all.



Safley and the empty chair at the head of the table, Estancia Accoyo

Today the Barreda family welcomes visitors, and the ranch is thriving. March, April, and May are good months to visit. January and February are about the only months that travel to Accoyo is made impossible by the weather.

As we finished the afternoon meal, I talked to Elena about the time in 1995 when Don Julio asked Mario Pedroza and me if we might find a way to help the children of Macusani. I asked what he thought we could do, and he said, "They need everything." Mario asked if we could offer some dental care. "Bueno!" said Don Julio, and at that moment Quechua Benefit was born. We made our first dental trip to Macusani in 1996. I told Elena that every tooth taken and every blanket given was the result of Don Julio's desire to help the children of Macusani. His vision will continue long after his passing. Every act of charity will be out of respect for him, and each donation made by an alpaca breeder will be inspired by the path he chose to walk. We hear you Don Julio. ■

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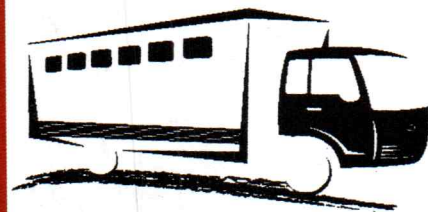
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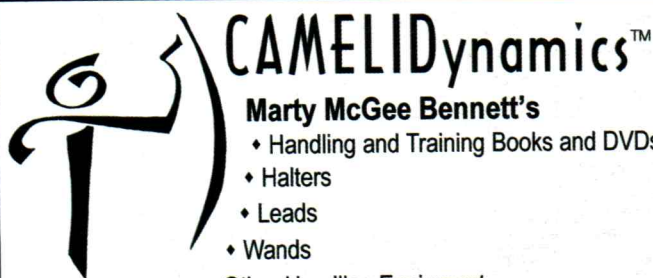
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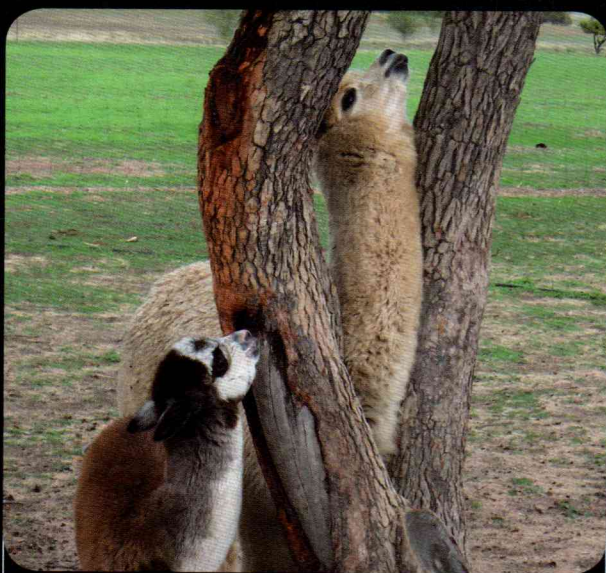
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✱ WINNER ✱



< Go away, I'm trying to hide >

Greg & Judy Winter • Winter Alpacas, WA



< Chasing her shadow >

Robert & Linda Power • Roblin Alpacas, NSW



< I may be small but I'm trying >

Carolyn Austin & Geoff McGowan-Lay • Lillyfield Alpacas, NSW



< Why do they put the best bits at the bottom? >

Fiona & Darrel Laughton • Beavona Lodge Suri Alpacas, QLD



< Dance time – step right, step left >

Julia Waller • Graceville Downs Alpacas, NSW



< Charge! >

Cora Zyp • Coraz Alpacas, QLD



< I'm the boss >

Christine & Graeme Purkiss • Bimbi Alpacas, NSW



< When is it my turn? >

Lesley & Alan Maxwell • Kurralea Alpacas, NSW



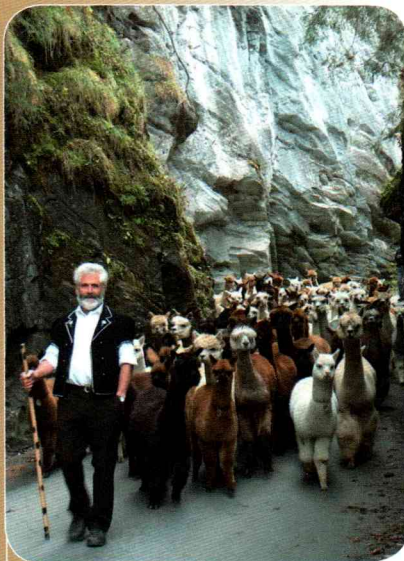
< Kiss me tender >

Dianne King • Wynwood Alpacas, NSW



< Come on in, Titch >

Joan & Vic Dohnt • Ailahtan Alpacas, VIC



< Coming down from the Alps >

Uli Lippl • Alpacas of Switzerland



< I want boots like those >

Richard & Kate Sheffield • Glenmore Alpacas, NZ



< Cute Mum, but a bit soggy >

Linda & Mark Agnew • Almaray Alpacas, VIC



< A nest for discerning Honeyeaters >

Keith & Lindy Montell • Robin Hill Alpacas, VIC



< Best buddies >

Jacqueline Dean & David Mehrrens •
McKenzie Park Alpacas, NSW



< Welcome to the world, Brianna >

Sue Rose • Rose Cottage Alpacas, WA



< You can be my new teddy >

Lesley & Alan Maxwell • Kurralea Alpacas, NSW

Upcoming Events

April

21-22 Autumn Alpaca Show: WA

Venue: Whiteman Park

Highlights: Alpaca judging

Contact: Ron Reid (08) 9296 4888

21-22 Alpaca Extravaganza: SA

Venue: Murray Bridge Racecourse

Highlights: Promotional display; demonstrations

Contact: Sharon Warland (08) 8532 3029;

Michael Peters (08) 8383 6478

27-28 Hawkesbury Show: NSW

Venue: Showgrounds, Clarendon

Highlights: Alpaca & fleece judging

Contact: Cheryl Kosaras (02) 4573 1177

May

3-5 Agfest: TAS

Venue: Oaks Rd., Carrick

Highlights: Promotional display;

alpaca product sales

Contact: John Milward (03) 6391 1433

4-6 Tocal Field Days: NSW

Venue: CB Alexander Agricultural College,
Tocal, Paterson

Highlights: Promotional display

Contact: Sandra Vella (02) 6564 2046

5-6 New Breeders' Seminar: NSW

Venue: Hawkesbury Racecourse, Clarendon

Highlights: Lectures, demonstrations

Contact: Alicia Anderson (02) 4573 1177

6 Field / Sale Day: WA

Venue: Youngs Siding

Highlights: Alpaca sales; promotional display

Contact: Lorraine Naylor (08) 9845 2316

10-12 Ipswich Show: QLD

Venue: Ipswich Showgrounds

Highlights: Alpaca and fleece judging

Contact: Julie & Sheren Macgregor

(07) 3202 3113

10-12 Agrotrend: QLD

Venue: Bundaberg Showgrounds

Highlights: Promotional display

Contact: Jessie Raines (07) 4159 4624

11-13 New England Alpaca Show & Wool Expo: NSW

Venue: Armidale

Highlights: Alpaca and fleece judging

Contact: Sandra Vella (02) 6564 2046

13 Alpaca Sale Day & Craft Display: WA

Venue: Pinjarra

Highlights: Alpaca sales, craft

Contact: Diana Jones (08) 9525 5741

19 Gympie Show: QLD

Venue: Gympie Showgrounds

Highlights: Alpaca judging

Contact: Anita Neeser (07) 5484 3487

19-20 Stawell Good Life Festival: VIC

Venue: Stawell

Highlights: Alpaca and fleece judging

Contact: Tracy Krupa (03) 5359 2388

June

1-2 Campbell Town Show: TAS

Venue: Campbell Town

Highlights: Promotional display;

alpaca product sales

Contact: Helen Dowd (03) 6239 6223

9-10 Industry Seminar: WA

Venue: Technology Park, Bentley

Highlights: Lectures, demonstrations

Contact: Sue Leitch (08) 9571 1787

10 Alpacas On Parade: NSW

Venue: Maitland Showgrounds

Highlights: Alpaca auction; pen sales;

lectures; fashion parade

Contact: Sandra Vella (02) 6564 2046

16 Sunshine Coast Show: QLD

Venue: Nambour Showgrounds

Highlights: Alpaca judging

Contact: Graeme Smith (07) 5445 9492

23-24 Alpacafest: VIC

Venue: Werribee Equestrian Centre

Highlights: Alpaca & fleece judging;

Promotional display

Contact: Reginald Smythe (03) 5266 1459

July

7-8 Winter Alpaca Show: WA

Venue: Ascot Racecourse

Highlights: Alpaca judging

Contact: Ron Reid (08) 9296 4888

7-8 Mudgeeraba Show - QLD

Venue: Mudgeeraba Showgrounds

Highlights: Promotional display

Contact: Shayne Barnett (07) 3200 0585

13-14 Mudgee Small Farm Field Days: NSW

Venue: Mudgee

Highlights: Promotional display

Contact: Judy Easten (02) 6372 1714

14-15 Laidley Show: QLD

Venue: Laidley Showgrounds

Highlights: Promotional display

Contact: Barbara Mills (07) 5465 4232

20-22 Bendigo Sheep & Wool Show: VIC

Venue: Bendigo Showgrounds

Highlights: Alpaca & fleece judging

Contact: Glenn Sutherland (03) 5472 2331

20-22 Farm Fantastic: QLD

Venue: Caboolture

Highlights: Promotional display

Contact: Deb Freeman (07) 5498 5508

27-28 National Alpaca Fibre Seminar 'Alpaca Fleece: the Future': VIC

Venue: Ballarat

Highlights: Lectures

Contact: info@alpacaultimate.com

29 Ballarat Sheep & Wool Show: VIC

Venue: Ballarat Showgrounds

Highlights: Alpaca & fleece judging

Contact: Vivienne Grigg (03) 5428 6712

29 Southern NSW Region Annual Show: NSW

Venue: Goulburn Showgrounds

Highlights: Alpaca judging

Contact: Graham Lugg; Tim Toshack
(02) 6227 3158; 0429 783 575

August

4 Spring Show: NSW

Venue: Bathurst Showground

Highlights: Alpaca judging

Contact: Kate Bailey (02) 6887 1233

6-7 Hamilton Sheepvention: VIC

Venue: Hamilton Showgrounds

Highlights: Alpaca & fleece judging

Contact: Andrew McCosh (03) 5565 9413

9-18 Royal Brisbane Show: QLD

Venue: Brisbane Showgrounds

Highlights: Alpaca & fleece judging

Contact: Camilla Smith (07) 3408 7639

11-12 Lardner Show: VIC

Highlights: Alpaca judging

Contact: Bob McLeod (03) 5629 1140

11-12 New Alpaca Breeders' Seminar: NSW

Venue: Robertson

Highlights: Lectures; demonstrations

Contact: Heather Vickery (02) 4885 2852

18-19 EPIC Alpaca Weekend: NSW

Venue: Fitzroy Pavilion,

Exhibition Park in Canberra

Highlights: Advertised pen sales; trade stands;
fleece competition

Contact: Geoff Shephard (02) 6227 6202

30-1/9 Gold Coast Show: QLD

Venue: Dalgety Showgrounds

Highlights: Alpaca judging (1 Sept)

Contact: Shayne Barnett (07) 3200 0585

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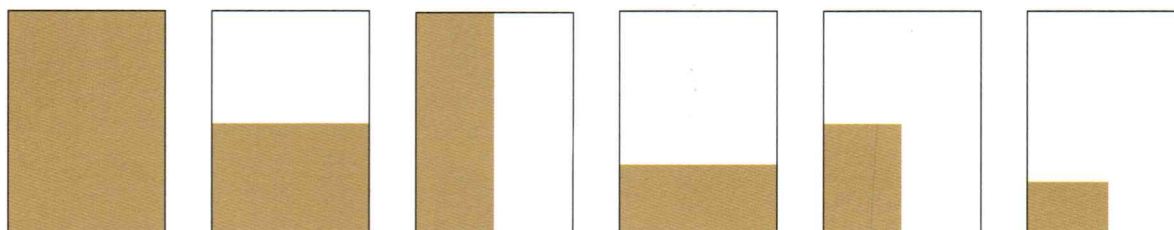
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Material

Editorial Material: If possible, all editorial contributions should be typed and preferably submitted electronically or by floppy disc in Word format. Visual material preferably supplied as colour photographs or transparencies. If supplying digital photography ensure that it is in high resolution of at least 250 dpi. We will endeavour to return all photos and slides.

Advertising Material: Please supply electronic artwork on disc to correct size. Preferred Macintosh programs InDesign, Illustrator or Photoshop. Alternatively save your adverts in high resolution pdf, jpg, tif or eps. Include all screen and printer typefaces, high resolution pictures, logos etc associated with the adverts. For full page adverts please allow 5 mm for bleed. Colour adverts to be supplied in CMYK (not PMS or RGB). Please supply hard copy proof in colour or mono (as applicable) for printing reference. We cannot guarantee inclusion of late adverts.

Further advertising material enquiries can be directed to:

Irene Garner, Garner Graphics: Phone +61 (0)2 4884 1222 Fax +61 (0)2 4884 1233 Email garnering@bordnet.com.au

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Issue 53: Winter

Due: August 2007

Deadline: Friday 1 June 2007

Issue 54: Summer

Due: December 2007

Deadline: Friday 5 October 2007

Issue 55: Autumn

Due: April 2008

Deadline: Friday 8 February 2008

Please book and send all editorial and advertising material to Sandra Wright

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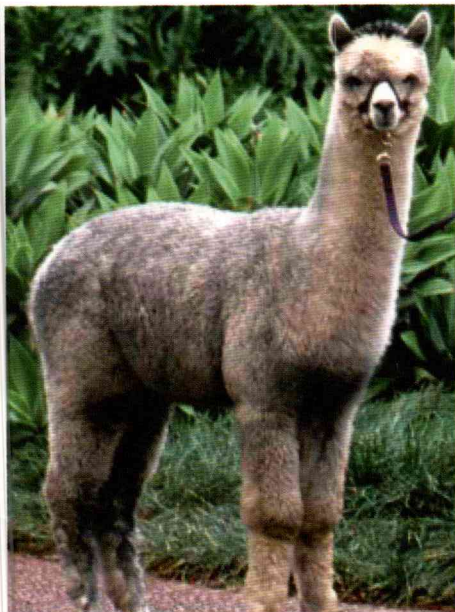
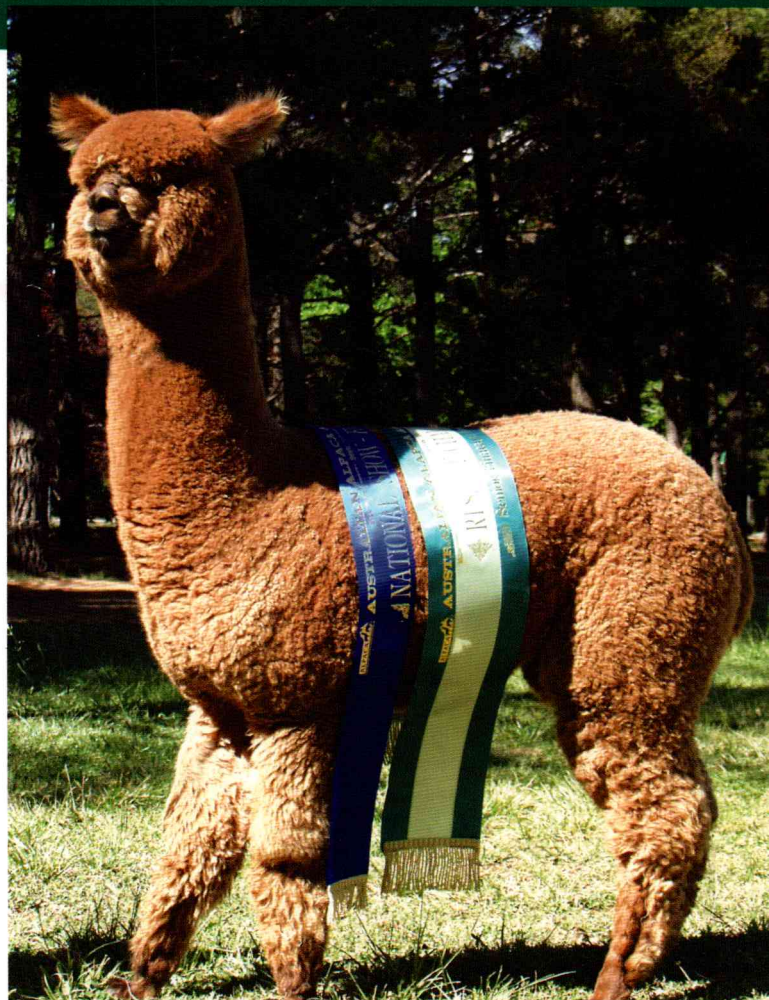
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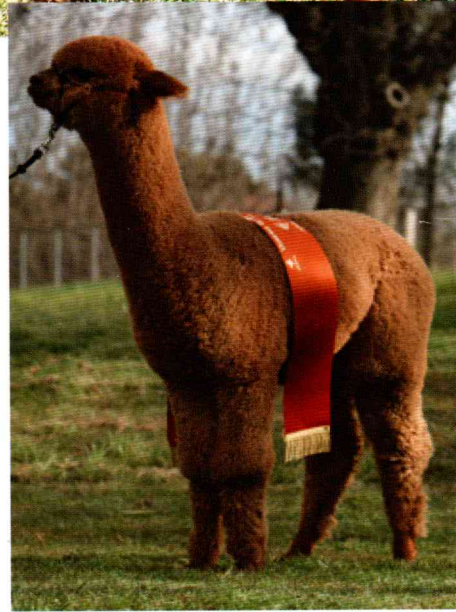
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Champion (4), including the Melbourne Royal and National Shows.
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First placings (12). Champion (1), Reserve Champion (2).
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Best Grey (3).*



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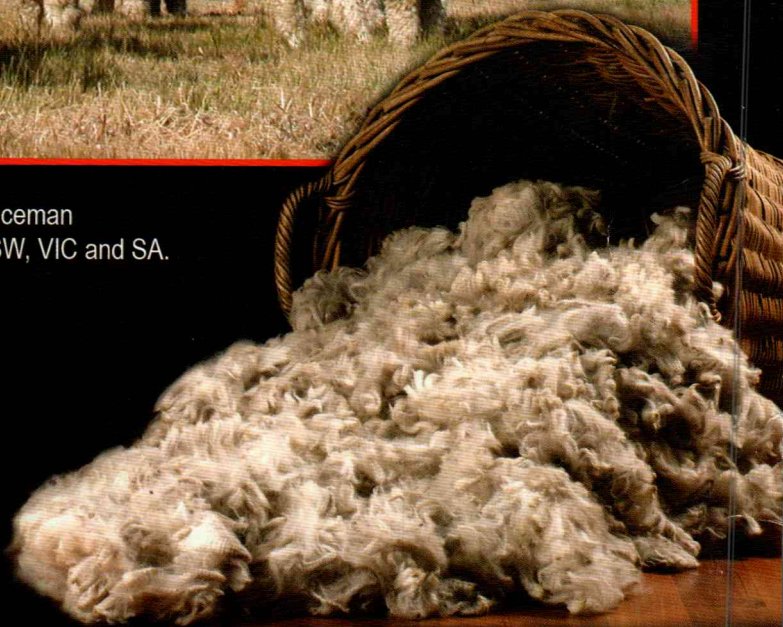
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