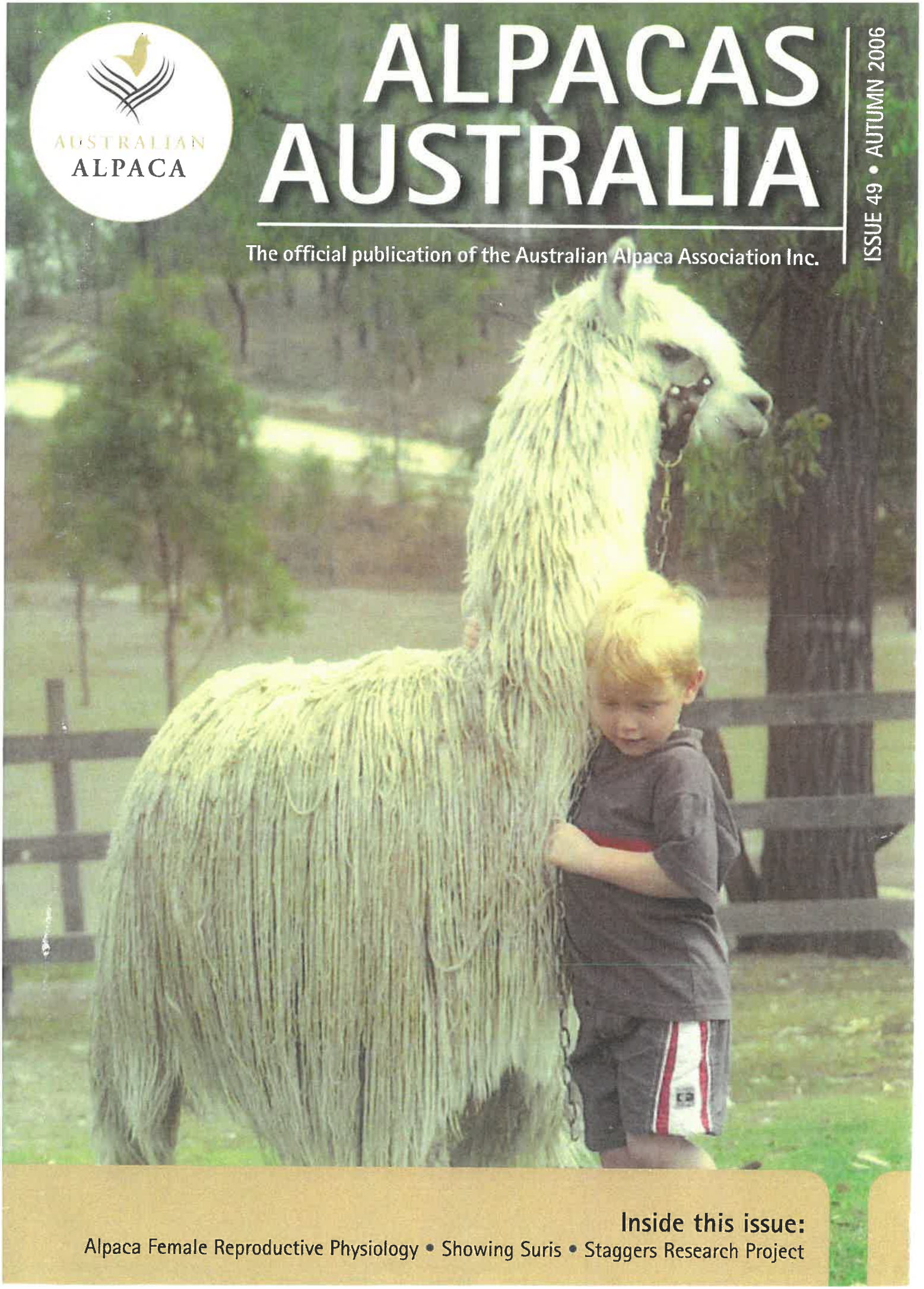


ALPACAS AUSTRALIA

The official publication of the Australian Alpaca Association Inc.

ISSUE 49 • AUTUMN 2006

Inside this issue:

Alpaca Female Reproductive Physiology • Showing Suris • Staggers Research Project


HALCYON
ALPACA STUD
Performance Alpacas
Ph. 03 5962 1319
★ SRS® Focused
★ Superior Genetic Progress using ET
★ Diverse Genetics Consistent Quality
★ For more information please visit our Web Site
www.halcyonalpacas.com.au
SRS WOOL

A Message from the President

Fleece for Fashion

Alpaca fleece has great qualities of insulation and handle; it can also be the foundation of beautiful garments. Some members of our Association feel there is too much emphasis on fleece. I believe you cannot over-emphasise fleece for some very basic reasons.

Animal quality is directly related to the conformation of the animal and the quality of the fleece. When we show our animals we are gaining an insight into their comparable qualities among the group being exhibited. Of course we know that animal quality has a direct relationship to price. High priced animals at auction for instance, do not get the high price because their fleece is ordinary.

At our conference at Noosa in 2002 we were introduced to a very successful representative of the Australian advertising industry. He was asked to give us his perspective of the industry and how he would promote us if he had the task. He declared that we should embrace the idea that we are not just a farming industry; we are also in the fashion industry. He used the wine industry as an example, citing that grape growers want you to buy wine, not grapes; in other words the end product, not the foundation.

Of course being in the fashion industry we are subject to the whims of the market. In the last year the major consumers of alpaca product, Europe and North America decided they wanted cashmere instead of alpaca. While the world price for alpaca is currently low we should not lose heart and falter in our desire to breed animals with better fleece characteristics. Better fleece makes better garments and that is our end goal. I should declare my personal interest in garments as I retail as well as grow my own fleece. I choose to send my fleece to Australian Alpaca Fleece Limited (AAFL) because I am a shareholder and I have a strong interest in the future of our industry and because I believe in what they are doing.

As a retailer I buy product from the strategic partners of AAFL and continue to look for other product which can supplement their lines. When customers ask me to compare cashmere and alpaca I respond positively that they are both fine fibres with different strengths for different garments, but of course cashmere is three times the price of alpaca.

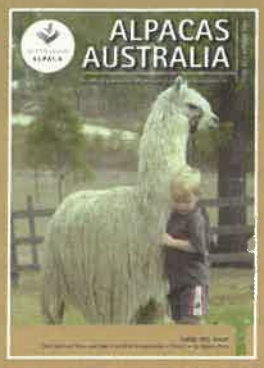
Much of our manufacturing is moving offshore due to sheer economics. It is sad that our manufacturers cannot compete with overseas product but it is a fact of life. The former Australian Alpaca Co-operative made a major contribution in developing products and markets and should be properly credited for it. At least one Australian company, having "cut its' teeth" on the Co-op, has now transferred to China so that it can be competitive in world markets. The company learned its skills on Australian alpaca and will continue to buy our fleece while we are producing good fibre.

It is fortunate for us that AAFL is finding markets for all grades of Australian fleece, even the stronger fleece. As well, there are other markets for fleece offered by entrepreneurial people who are doing a good job in advancing the product in the market. We should continue to strive for fleece improvement by better breeding with better outcomes right through to the finished product.

Not only fleece for fashion - fleece is fashion. ■

Kerry Dwyer, President

COVER



Portrait by Robyn Cuerel, Bundaberg News Mail.

Jackson (grandson of Darrel & Fiona Laughton, Beavona Lodge Suri Alpacas) and friend.

See 'Showing Suris' article on page 20.

PUBLISHER

Alpacas Australia is published by the Australian Alpaca Association Inc
A0021333P • ABN 33 710 945 160 • ARBN 067 146 481
Unit 2, 613 Whitehorse Road
Mitcham, Victoria 3132 Australia
(PO Box 1076, Mitcham North, Victoria 3132)
Telephone +61 (0)3 9873 7700 Fax +61 (0)3 9873 7711
E-mail alpaca@alpaca.asn.au Internet www.alpaca.asn.au

EDITORIAL AND ADVERTISING

Sandra Wright, Australian Alpaca Association Inc
Unit 2, 613 Whitehorse Road
Mitcham, Victoria 3132 Australia
(PO Box 1076, Mitcham North, Victoria 3132)
Telephone +61 (0)3 9873 7700 Fax +61 (0)3 9873 7711
E-mail sandra@alpaca.asn.au Internet www.alpaca.asn.au

RATE (PER ISSUE)

AUD $7.70 · Australia

SUBSCRIPTION RATE (3 ISSUES)

AUD $28.05 . Australia
AUD $40.00 . New Zealand
AUD $50.00 : International

CIRCULATION

3,500 for current issue

DESIGNED AND PRODUCED

by Garner Graphics
'Riverside' Lot 4, Inverary Road, Paddys River NSW 2577
Telephone +61 (0)2 4884 1222 Fax +61 (0)2 4884 1233
E-mail garnering@bigpond.com.au

ISSN 1328-8318

ADVERTISERS

REGULAR FEATURES

EDUCATION

RESEARCH AND DEVELOPMENT

ANIMAL HEALTH AND WELFARE

SHOWING AND JUDGING

FLEECE

FASHION

SURI

INDUSTRY

Briefly Speaking

From Downunder to the UK

AAA Inc. accredited judge, Dominic Lane is heading to the UK to take up the position of manager of Bozedown Alpacas. Bozedown Alpacas runs a herd of over 800 females including over 100 suri on their property in Reading and another 200 females at their Somerset property.

"Joy Whitehead, owner of Bozedown, has decided to retire from farm operations and my family and I are in a position to expand our horizons," explained Dominic. "A move to the UK has been in our minds for some time because we have always loved England and we feel that the British alpaca industry, along with the Australian alpaca industry, has the potential to breed some of the best alpacas in the world."

Dominic is looking forward to sharing his Australian alpaca knowledge and expertise with the UK and will undoubtedly bring back international experiences to share upon his return to Australia.

www.alpaca.asn.au

A vital source of information on alpaca events, alpacas for sale, latest industry developments and much more! The AAA web site is vibrant and dynamic and is an important communication link for AAA members and non-members alike.

FROM THE EDITOR

Do you have an interesting story to tell, perhaps your version of *My Shed*... (see page 16)? Are there any topics that you would like to read about in *Alpacas Australia*? Please send your articles and ideas... we'd love to hear from you.

13th AAA Inc. National Show and Sale

27-29 October 2006
Exhibition Park, Canberra

In 2006 the trend of previous years is sure to continue and record numbers of entries are expected in all classes. Don't miss participating in this annual premier event. Set aside your best fleeces and select your show animals. Be creative for the craft section and the popular art/photography section. Enquiries can be directed to: Show Convenor, Paul Haslin 02 4878 9429 or e-mail: *elysion@ozemail.com.au*

Have you moved?

Please remember to notify the AAA National Office of address changes, including telephone and fax numbers if applicable. Let us know by:

Phone +61 (0)3 9873 7700
Fax +61 (0)3 9873 7711
Email alpaca@alpaca.asn.au

2006 Royal Canberra Show

SHOWING AND JUDGING ARTICLE by **Carolyn Austin** > Convenor

The 2006 Royal Canberra Show saw the largest attendance of both animals and fleeces in the show's history, some 260 animals and 160 fleeces.

Apart from a noticeable lack of humour on the convenor's part (myself) when things were not going as planned, all exhibitors displayed a graciousness that was much appreciated. Also appreciated was the extraordinary effort of the judge, Jenny Jackson (aka Wonder Woman).

On the Saturday morning trip to Exhibition Park in Canberra (EPIC) Jenny was faced with an unexpected traffic jam that had cars backed up for nearly an hour. Jenny abandoned her car at a service station and ran to the judging area - what happened to the car, we can only guess. What a woman... and all this after a full day of judging fleeces the day before. So, with a late start due to the vagaries of Canberra traffic, Jenny still managed to judge 260 animals in a professional and consistent manner, finishing by 3.45pm. She then backed up again on the Sunday giving generously of her time to each and every exhibitor who asked her questions and advice.

Even though a number of regular large breeders did not attend this year the numbers still required us to ask some exhibitors to share pens (for the first time). This is an indication of the strength of the industry and the popularity of the Royal Canberra Show and I thank all those that were affected for their co-operation. I need to put my thinking cap on to come up with some acceptable solutions to a finite pen capacity and an ever increasing demand for entries.

Disappointingly, the Suri classes were poorly attended. I am not sure if it is the time of the year or some other reason, as the Suri fleece classes where also poorly patronised. But on a happier note, this year we had a few more Victorian breeders make the long journey to Canberra and all were rewarded with excellent results, including Supreme Suri.

> Supreme Suri: *Kurrawa Tari Q ET* exhibited by Kurrawa Alpacas, Vic

> Supreme Huacaya: *Illawarra Yucatan* exhibited by Illawarra Alpacas, NSW

> Champion Suri Fleece: *Traron Maxima* exhibited by Traron Alpacas, NSW

> Champion Huacaya Fleece: *Illawarra Yangtse* exhibited by Illawarra Alpacas, NSW

> Suri Sires Progeny: *Cedar House Sensational*

> Huacaya Sires Progeny: *Shanbrooke Accoyo Yavari*

Once again I would like to thank my team of willing and very tired helpers, the Sponsors, owners of stud sire services, the Vetting Stewards, Marshalling and Ring Stewards, the Help Desk Team, the front of Show Group, Announcers, Score Keeper, Fleece Stewards... the list is endless and I will mention each by name in another forum. I would hope that all exhibitors appreciate the enormous effort that goes into running a show the size of Canberra Royal and that, without the assistance of so many often forgotten individuals, the show would simply not happen. ■

For full results visit *www.alpaca.asn.au*

The noticeable change that is emerging is the increase in the number of animals in the adult huacaya classes. In years gone by these classes were only modest, but now due to the rapid increase in quality of our animals and their ability to hold their fleece quality for a longer period, the numbers are rivalling the junior classes.

Supreme Suri: *Kurrawa Tari Q ET*

Supreme Huacaya: *Illawarra Yucatan*

Shanbrooke

The Accoyo Alpaca Centre

Australian Alpaca Training Centre

* Training
* Quality
* Support
* Selection

* Stud servicing
* Elite stud sires
* Specially selected stud stock
* Consistent show winners
* 16 Years experience

SELECTION

When purchasing alpacas your foundation stock is the most important decision you'll have to make which will affect your success for years to come. Let us help you choose from our large selection of alpacas. Where sure you'll find one you love.

Ron & Dianne Condon Ph: (03) 9730 1399 Mobile: 0409 547 630
Email: shanbrooke@bigpond.com Web site: www.shanbrooke.com.au
Steels Creek Rd Yarra Glen Vic / Limestone Cottage Yea Vic

"From Here, To Wear"

2006 AAA INC. NATIONAL ALPACA INDUSTRY CONFERENCE

EDUCATION ARTICLE by **Jolyon Porter** > Conference Convenor

Alpaca National Conference 2006 Adelaide

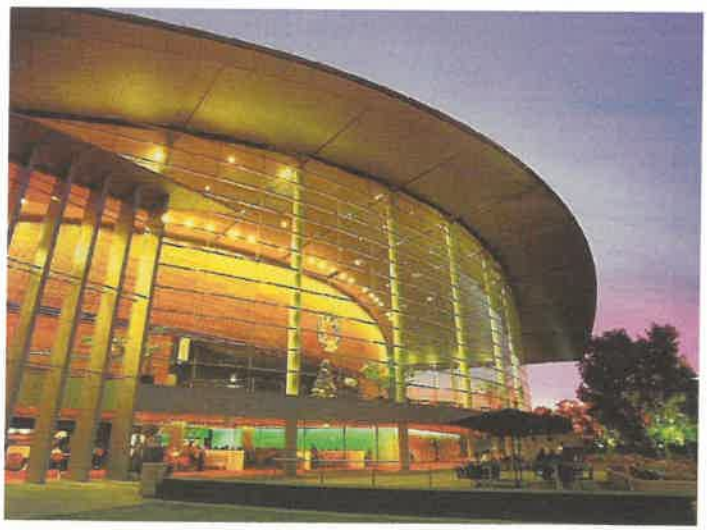
The 2006 Australian Alpaca Association Inc. National Conference, set for Adelaide on 18-20 August, is well and truly starting to take shape, so mark your calendars now. We will be aiming to have a varied and comprehensive agenda, whilst keeping an eye on cost reduction, so that it is as interesting and affordable as possible.

A small and dedicated group of South Australia Region members are putting together a programme that all participants of the alpaca industry should find interesting and entertaining.

The main venue for the conference will be the world class Adelaide Convention Centre, perched on the banks of the River Torrens and only a couple of minutes walk from the city's CBD.

The ACC is located near a dozen or more accommodation operators of various levels – from 5 star hotels to backpacker hostels. There are a number of car parks located in the area, including one directly under the Centre, and all at reasonable prices.

Adelaide Convention Centre



Friday night's official reception will be held off-site at the National Wine Centre, only five minutes drive from the ACC. This building, with its unique design and construction features, will be the focus of a buffet dinner, fashion parade and tour of the 'Wine Tunnel'.

The fashion parade will be an opportunity for TAFE College Textile Design diploma students to display their skills with alpaca cloth.

At the time of writing, the programme for the Conference is still being finalised, but we have a number of excellent speakers and researchers committing to attend and present their latest findings.

Topics to be covered will quite probably include:

> pasture sustainability and native species;

> vitamin D and phosphate requirements in alpaca;

> pasture borne toxicoses (staggers);

> experiences with ET;

> line breeding - costs and benefits;

along with various craft and animal handling workshops.

We have had a number of speakers who have been carrying out research come forward and submit summaries about their work. They all seem quite keen to share their discoveries with the industry.

All conference speakers will be submitting their lectures for publication in the Conference Proceedings, which will be included in the registration packs, as well as available to purchase from the AAA National Office for those unable to attend.

There will be limited advertising space available in this publication, so interested parties should act early and contact Jolyon Porter (e-mail: *info@yackaridge.com* or Tel: 08 8568 5254) promptly to make a booking.

Registration forms for the Conference, Saturday night dinner, reception, exhibition space etc. will be mailed out to all members, but will also be available for downloading from the Conference Web Page *http://www.alpacassouthaustralia.au.com/confpage.html* as will accommodation information. For those without computer access, and who did not receive a post pack, please contact Jolyon Porter for standard delivery (post or fax).

Do not forget that the Conference is open to all interested persons, not just AAA members, so why not encourage potential breeders to consider coming along, as there will be a number of basic/beginner topics covered to cater for them.

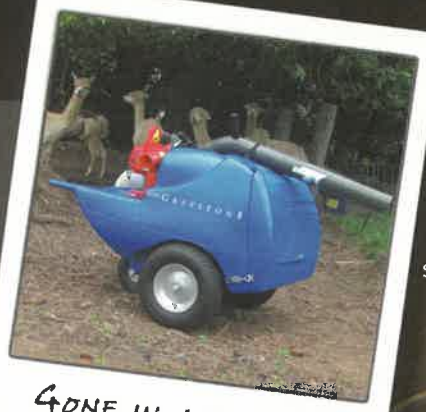
Whilst there will be three, and sometimes four, parallel streams of talks, it is hoped that some of the more popular lectures will be repeated to ensure that delegates get a chance to catch as much as possible in their fields of interest.

Organising something as complex as the National Conference is certainly a big job, so I respectfully ask that all those wishing to make bookings of any kind, be it for attendance, advertising, or exhibition space do so promptly to make our load a little bit easier.

There will not be any post Conference tours organised due to the practicalities of such events, but I am sure you would be made welcome by any of the local studs should you wish to have a nosy 'round; after all, we do have some of Australia's best alpaca here! Make use of the breeder's directory, which will be included in the information packs and make your appointments to visit some of the many studs located around the state.

For those who wish to make a bit more of a holiday of their trip, contact SA Tourism, *http://www.southaustralia.com/home.asp* or Tel: 1300 655 276, for information on some of the fantastic attractions this state has to offer. One event you might like to take in is the Royal Adelaide Show alpaca judging, on September 1st, with Jill MacLeod, from Canada, as our special guest judge. ■

AUSTRALIA'S NUMBER GREYS



GONE IN A FLASH!!

Picking up manure has never been this easy... Designed and built in Australia for Australian conditions, we use 'A' grade polyethylene in our bodies and collection nozzles for strength and durability. Our hoses are finest quality, reinforced and UV protected, with ergonomic user friendly hand grips, and we use marine grade stainless steel hinges and fittings throughout.

LOOKED LIKE A BIG JOB THIS MORNING!

The Maxi and Paddock-Vacs easily attach to a standard 50mm tow ball or pin set up for towing behind a ride on mower or quad bike. Our mid-sized machine holds 3-4 wheelbarrows, and is powered by a gutsy 48cc Kawasaki motor. All our machines pick up manure in any conditions; wet or dry, long grass or short, all with astounding ease. You can even empty the water in drinking troughs!

COULDNT BE EASIER TO CLEAN!

All our machines have an easy opening/closing hinged rear door (with no air leaks) and simple tipping action for emptying. Servicing can be carried out by your local mower shop or by the home handyman, plus we provide a five year guarantee on parts for peace of mind.

BUILT LIKE A BRICK THINGY!

Greystone has a machine for all applications, from the mighty Maxi-Vac and mid-sized Paddock-Vac to the brilliant, brand new Yard-Vac which can be pulled around by hand and converts to a hand held blower in seconds. It holds around 2 wheelbarrows, and is powered by a Honda 4 stroke motor with a 2 year guarantee.

CALL US NOW FOR A DEMONSTRATION ON 0439 603 703

Launch of New Alpaca Hand Knitting Book

FASHION ARTICLE by **Michael Talbot** > Managing Director, Australian Alpaca Fleece Ltd.

One of the most exciting events to happen to the Australian Alpaca industry in 2006 is the launch of the Jo Sharp alpaca hand knitting yarns. Jo Sharp currently produces an amazing range of hand knitting products and is, without a doubt, the most creative hand knitting label in Australia.

Jo Sharp

For more information visit *www.josharp.com.au*

To go with this launch she has produced a fantastic pattern book, which will be sold in Australia and the United Sates, that includes patterns especially designed for a vast range of alpaca knitted products.

Jo's company started in Western Australia in 1992, with the first collection being designed for David Jones, and has grown over the years to be not only selling her range around Australia, but also to over 400 stores in the United States. Her range of pattern books have really become collector's items and end up on coffee tables and design studios all around Australia.

Featured in the book are two fabulous new alpaca hand knitting yarns, both are luxuriously soft and great to knit with. During the development of these yarns, Jo's studio collaborated with the alpaca growers of Australia to find the most ideal fibre grades for softness and performance, both for knitting and for wearing.

Alpaca Silk Georgette yarn is made from super fine alpaca blended with silk and very fine merino to produce a delicately grained flat fabric with excellent regain (regain is the ability of a yarn to come back into shape after washing and wearing). This yarn is the finest in the collection to date and excellent for use in classic vintage knits with lots of intricate stitch patterning, or for babywear.

The second new yarn is Alpaca Kid Lustre, another highly successful blend, capturing the super softness of alpaca, the bright lustre of fine Kid Mohair and the loftiness of super soft Merino. This lustrous yarn works well in men's and women's garments, or homewares such as cushions and throws, as you will see inside the pattern book.

Both these yarns drape very softly and mould easily to fit the body snugly. The resulting garments are lightweight and express a sensual, feminine aesthetic. You are invited to enjoy both the knitting and wearing comfort of these sensational new yarns.

The front cover of this exciting new pattern book features an Australian alpaca hand knitted garment. Inside you will find 96 pages of hand knitting patterns covering the full Jo Sharp range, many utilising the new alpaca yarns.

The book will be sold in newsagencies around Australia and internationally. This will be more than just a pattern book. It will become a talking piece that will be around for a long time.

How to order the pattern book

For a limited time Australian Alpaca Fleece Ltd. is offering 15% discount off the book's normal retail price of $16.95 (incl. GST).

Please take up this offer and contact the AAFL office today to reserve your copy/ies:
Tel: (03) 9311 0933
Fax: (03) 9311 0499
E-mail: info@australianalpacafleece.com.au

As an additional fee for freight applies, AAFL will calculate that charge and advise you of the total amount required. Upon receipt of your payment made by cheque or money order the book/s will be forwarded to you. It is regretted that AAFL does not offer credit card facilities.

This is a limited offer so, "First in, best dressed." ■

Are YOU missing out?

...on the opportunity to advertise your alpacas, stud males and services on Australia's largest online trading place?

Basic Account

$60pa

For all this at right.
First month FREE!

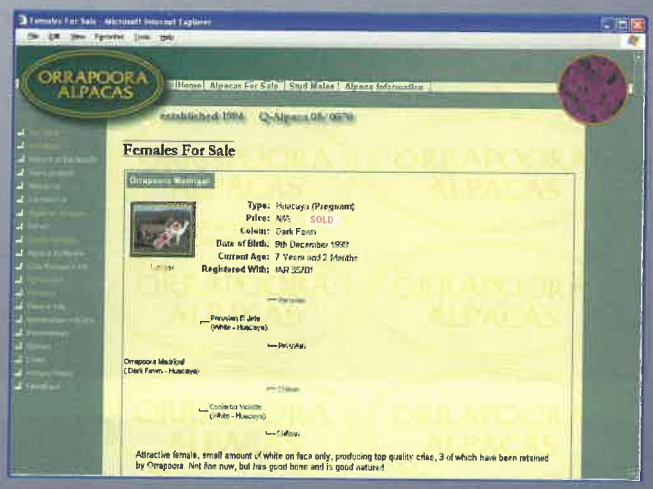
No website required!

- *unlimited* alpacas for sale
- *unlimted* stud services for sale
- *unlimted* packages for sale
- up to two photos per listing
- breeder details
- your logo
- your farm photo (for fun)
- view animal requests from searchers
- view stud requests from searchers
- view general enquiries
- news and diary dates
- services you offer
  - agistment
  - stud services terms and conditions
  - shearing
  - backup/support
  - financing
  - export/import
  - alpaca yarn/knitwear for sale
  - alpaca fleeces for sale

...on the opportunity to have these same data appear automatically and seamlessly in your own personal website?

Integration from $60pa

(excludes web design) setup fee applies



The page at right was generated from AlpacaSeller data: would you know if we didn't tell you? *Any of the features listed above can be displayed on your own website in its own page.* See the seamless integration for yourself at www.orrapoora.com.au.

Don't have a website? We can build and integrate one for you.
Do have a website? Existing websites can be integrated at any time.

Look at the power AlpacaSeller offers to help you make sales!

- *Any data on AlpacaSeller can be seamlessly integrated into your own website* - enter once, display twice!
- Fully automated show success page - *all built from AlpacaSeller information* (integrated websites only)
- Automatic Stud matching on Sire, Covering Male and Sire of Cria at Foot (if the male is one of your stud services)
- Automated "New" feature - shows animals added to your sales list in the last month
- Automated age calculations from date of birth and last sample date of fleece
- AlpacaSeller automatically optimises your photos for fast web loading
- The world's only alpaca herd and business software, Optimate AlpaFarm (www.alpafarm.com), can now upload data directly from your computer to your AlpacaSeller account - enter once, display thrice, on your computer, your AlpacaSeller account and your own personal website!

Are you connected to THE marketplace?

ph/fax 02 4227 5975 www.AlpacaSeller.com.au

AlpacaSeller AU
MATCHING BUYERS & SELLERS ACROSS AUSTRALIA

AlpaFarm now uploads data!

Highlights from Sydney University Alpaca Research

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.

The Team

The Alpaca Research Team of Professor Chis Maxwell, Professor Gareth Evans and Dr. Katherine Morton have selected the students to complete the team. Ms. Kirstie Bailey is the new Ph.D. student who will assist Dr. Morton in the principal RIRDC research.

Honours students Ms. Zamira Gibb and Ms. Sarah Wilson have commenced their research. Both of them have a keen interest in alpacas and are excited to have been selected for the first alpaca research projects offered by the Faculty of Veterinary Science.

Ms. Kirstie Bailey has recently completed a B.Sc. (Agr.) (Hons.) and her honours thesis is entitled *"The identification and role of p53 in ram spermatozoa"*. p53 is a tumour suppressor protein, which has critical roles in cells with damaged DNA including cell cycle regulation and the initiation of apoptosis (cell death). These roles are essential for the stability of the genome, and the prevention of damaged DNA being transferred to daughter cells. Previous research had identified the presence, and examined the role of p53 in cancer cells, mouse embryos and during particular stages of spermatogenesis in mice. Kirstie's research was the first to identify this crucial protein in ram spermatozoa. She identified the protein in whole sperm and subsequently in the acrosome[1] and the midpiece of the sperm.

Kirstie has had a long interest in alpacas, and was disappointed when she learned that she would be unable to do an alpaca honours project in 2005. Kirstie's first task will involve testing some novel hypotheses she has formed with the aim to improve the reliability of semen collection in alpacas. ➤

The Alpaca Research Team (left to right): Professor Chis Maxwell, Dr. Katherine Morton and Professor Gareth Evans examining the post-thaw motility of alpaca sperm

Ms. Sarah Wilson diluting alpaca sperm prior to freezing

Australian Government
Rural Industries Research and Development Corporation

REPROGEN

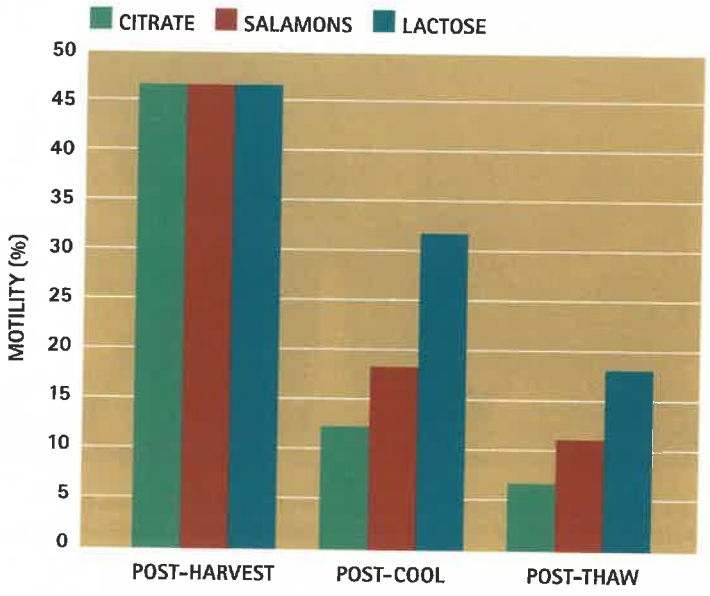
The Research

The results of Dr. Morton's current research projects will be presented at several important international conferences being conducted this year.

Dr Morton reports on her research...

"In January, my research focused on continuing my work on freezing epididymal alpaca sperm. With the generous donation of testes from six males I was able to complete my first experiment comparing different freezing diluents. The results clearly demonstrate that the lactose based diluent is far superior to the Tris-citrate, and Citrate (used previously for alpaca epididymal sperm[2]) diluents.

I will present the results of this experiment at the **10th Annual European Society of Domestic Animal Reproduction (ESDAR)** conference held in September.



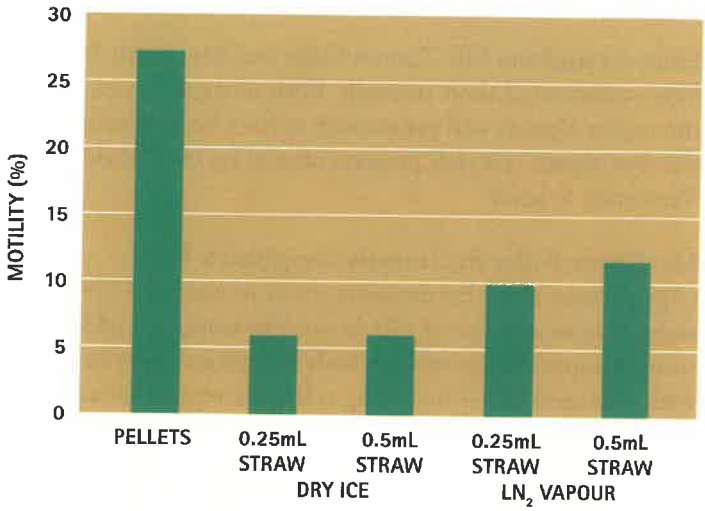
Motility for epididymal alpaca sperm after harvest and dilution (post-harvest), cooling to 4°C (post-cool) and freezing and thawing (post-thaw) collected from 10 males.

The second experiment I conducted was to compare freezing sperm in straws or pellets. Pellet freezing of sperm is generally regarded as superior (owing to the freezing rate). However, most sperm is frozen in straws (0.25 or 0.5 mL) as the cattle and horse AI industries are based on sperm frozen in straws (because the import/export of semen is restricted to straw frozen sperm).

This experiment compared freezing sperm in pellets on dry ice (used extensively in Australian sheep AI), 0.25 and 0.5 mL straws on dry ice (popular for wildlife species such as dolphins) and 0.25 and 0.5 mL straws frozen over liquid nitrogen vapour (used extensively for bull, stallion and camel sperm freezing). The results show that pellet freezing sperm is superior to straws frozen on dry ice and in liquid nitrogen vapour.

Sperm frozen in pellets retained 70% of their original motility, which is consistent with other species such as sheep and cattle. While the post-thaw motilities in both these experiments are lower than I would like, I expect that we can considerably improve the post-thaw motility of alpaca sperm by trialling different freezing rates and protocols. Research is continuing into establishing the optimal protocol for freezing alpaca sperm in straws.

I'm planning to present this research in the Camelid section at the **2006 Ruminant Reproduction Symposium** held later this year. I'm also currently writing a manuscript on the cryopreservation of epididymal alpaca sperm, which I hope to submit later this year (this will represent the first peer-reviewed scientific publication of epididymal alpaca sperm).



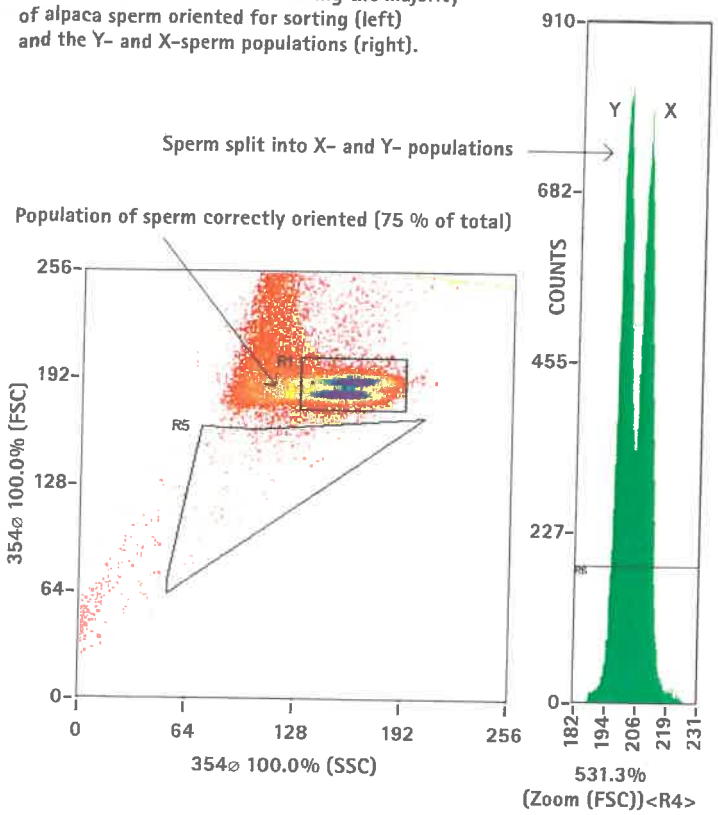
Post-thaw motility for epididymal alpaca sperm frozen in pellets, 0.25 mL and 0.5 mL straws on dry ice, or 0.25 and 0.5 mL straws in liquid nitrogen vapour.

Another one of our research objectives is to establish the relationship between age, testicular size and testicular development (assessed histologically). Preliminary data suggests that there are vast differences between males in the timing of initiation of sperm production, the number of sperm produced and ability of the sperm to survive freezing.

The preliminary results of this study will be presented by Kirstie Bailey at the **2006 Ruminant Reproduction Symposium,** held in New Zealand.

Some of my other research has focused on establishing the DNA difference between the X and Y-chromosome sperm in alpacas. In mammals, the X-chromosome contains more DNA than the Y-chromosome, and it is this difference that forms the basis of sperm sexing by flow cytometry.

The printouts show that a high proportion of sperm are correctly oriented. These are the sperm which are able to be separated into X- and Y-populations by the SX MoFlo.



I will be presenting these research results (at the request of RIRDC) at the first conference of the **International Society of Camelid Research and Development** in Dubai. I'm also looking forward to visiting the laboratories of legendary camel researcher, Dr. Skidmore to discuss various aspects of camelid research.

Our plans for the immediate future include continuing our investigations on the effects of some enzymes on semen viscosity and sperm motility, further testing of different diluents and temperatures for the liquid-storage of alpaca sperm.

I would like to thank Mrs. Iona McKinnon (head of the AAA Research & Development Sub-committee), and Currabungla Alpacas for their generous support of the current phase of the research project. Anyone interested in more information about our research, or participating in research is encouraged to contact me". ■

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.
Phone: 02 9351 3463
Fax: 02 9351 3957
Mobile: 0412 187 824
Email: kmorton@vetsci.usyd.edu.au

References

1 The acrosome is a membrane encasing the head of the sperm that has an integral role in fertilisation.

2 Bravo, P.W., Alarcon, V. and Bondurant, R.H. (2000). *Epididymal spermatozoa characteristics and its use on artificial insemination of llamas and alpacas.* Proceedings of the 14th International Congress on Animal Reproduction 2 92 (abstract).

My Shed ... the Suncloud Shed

INDUSTRY ARTICLE by **Peter Richards** > Suncloud Alpacas, WA

Suncloud Farm is situated 280kms east of Perth on 650 acres at Merredin, in the Eastern Wheatbelt. The Suncloud shed has been purpose built for alpaca handling.

The shed has four main areas:

1. The shelter and husbandry area
2. The shearing area
3. The veterinary area
4. The feed storage area

Area 1: The shelter and husbandry area

This is what we call in the west an eco shelter; we sourced this from a local manufacturer and installed it ourselves.

The construction consists of 50mm medium wall galvanised pipe bent in a semi-circle and attached to 65mm rolled hot steel (RHS) posts which are concreted into the ground. A tarpaulin specifically manufactured for the purpose is stretched over the curved structure and tied down to pipe side rails.

The area is 20 metres long x 12 metres wide x 5 metres high. I have divided this area into eight pens with a raceway down the middle, at one end this is again divided into two sections for the drafting of animals.

The floor is concrete which is easily cleaned with a pressure cleaner. The pen panels are constructed using 50mm RHS top and bottom rails and filled in with 130mm x 40mm stained pine boards. The bottom rail is 100mm off the floor to facilitate easy floor cleaning, above the panels I have used cattle rail. The panels are welded to 65mm posts which are dyna bolted to the concrete floor. Total height of the panels is 1100mm.

All pen gates are of similar construction and can be simply lifted off their hinges and removed very easily, when for various reasons you have to shed a large number of animals. The alpacas are able to move freely and crias are not separated from their mothers.

Although we are predominately white breeders we still have some coloured animals so the drafting race is useful at shearing time to separate the various colours.

Cost wise the eco shelter is comparatively cheap compared to steel construction. To build a steel frame shed the material cost was $13,000, whereas the eco shelter was $4,500 and only took two days to erect. The tarpaulin has a 15 year guarantee. The internal yards/pens cost approximately $9,000 including concrete. These prices do not include labour costs; all construction and manufacture was carried out by me, so if you used outside contracts you would probably double these costs.

Area 2: The shearing area

The actual shearing shed abuts the eco shelter. The construction is brick to a height of 600mm and above that steel frame clad with custom orb.

The cost of this part of the shed complex was $37,000 including electrical work. This was also constructed by me with the help of a neighbour.

Tradespeople in our area are about as easy to procure as a Vicuña, so you have to be the welder, carpenter, plumber, gyprock fixer, bricklayer etc. I must not forget "she who must be obeyed" was the Construction Supervisor at all stages.

The shearing shed has two doors which open onto the eco shelter, one for the catching pen and the other to release the animals after shearing.

We use two stations when shearing and initially we tie up two animals – while the shearer shears one I carry out any necessary husbandry on the other. We then swap and complete the various tasks on the other animal.

nd of Area 1 divided into two sections (top photo).
he doors from end of Area 1 lead to Area 2 (bottom photo).
verhead rail system facilitates moving the shearing head.

o move the shearing head from either station I have nstalled an overhead rail which is an industrial door track tted with rollers; the shearing head is attached to the llers and easily moved to either station.

At shearing time our shearer, Kevin Gellatly brings his partner Amanda who is a professional wool handler. Amanda sorts the fleece, neck and leg pieces etc. and throws the fleece onto the skirting table where the final skirting is done.

We find that by using a professional wool handler it eliminates 2-3 volunteers/helpers and we get a better job done. This leaves me to concentrate on keeping the flow of animals up to the shearer. We are able to shear 120 animals comfortably in an 8 hour day.

Area 3: The veterinary area

Incorporated in the shearing area is an area that we use for veterinary purposes. The area is fitted out with free standing stainless steel benches, drawers, sink, hot water system and anti-bacterial soap dispensers so the vet is able to do minor procedures and castrations in a dust free environment. This area also has toilet and shower facilities.

We sourced all benches and stainless steel hardware from a hotel and restaurant supplier.

We have run computer and telephone cables from the house to the shed so at shearing time we can record each animal's relevant details instantly.

The area is fitted out with 20 x 4ft. fluorescent lights to give good lighting. We are currently insulating the shed with 75mm styrene foam and installing air conditioning.

Area 4: The feed storage area

This area is for supplement feed preparation, vet supplies and any animal handling equipment.

There is only one more addition to my wish list, and that is a pneumatically operated alpaca crush, as only a handful of our alpacas are halter trained.

The crush is on the drawing board, and I reckon after I have finished building numerous prototypes I might get one that works. ■

Magazine Catalogue Now Available on AAA Web Site

INDUSTRY ARTICLE by **Sandra Wright** > Australian Alpaca Association Inc.

Alpacas Australia is pleased to announce that a catalogue of articles, published since the inception of the magazine in 1992, has been compiled and is now available to view on the AAA web site at: *www.alpaca.asn.au*

The painstaking task was undertaken by Irene Garner of Garner Graphics, the current magazine design company. Irene's dedication to the production of the Association's magazine is unwavering. The compilation of the catalogue took a considerable amount of time and was indeed long overdue. Irene's *pro bono* efforts are to be commended and are greatly appreciated.

Alpacas Australia is currently in its 49th edition, having been born in 1992 when the Australian Alpaca Association was in its toddler years. The magazine has evolved through the years from a slim publication comprising 32 pages in Autumn 1992 to today's glossy journal of 64 pages. During that time the aims of the magazine have been to entertain, inform and impress the alpaca community through the publication of stories written by members of that community. From the technical text of scientists and veterinary specialists to the homespun yarns of alpaca breeders sharing their experiences, *Alpacas Australia* has published them all.

Articles are listed in the catalogue under the following headings:

> Education > Showing and Judging > Fashion
> Marketing > Animal Health & Welfare > Industry
> Breeder Profiles > Research & Development > Suri

and are further defined by issue number, page number, title of article, brief description and author.

I'm sure the catalogue will prove to be a valuable resource for AAA members, students, researchers and in time, historians!

The AAA National Office has back issues of some magazines still available to purchase at $3.30 per copy (plus P&H). Unfortunately some issues are no longer available to purchase as stock has been depleted.

The AAA library contains a full set of *Alpacas Australia* magazines which are available for borrowing by AAA members under the required conditions. ➤

I would like to purchase ☐ back issues @$3.30 each.
Please specify issue numbers _____

(As some issues are sold out or in limited supply please contact the AAA National Office to enquire about availability).

(PLEASE PRINT)

Name MR / MRS / MS / MISS / DR _____

Address _____

_____

_____

State _____ Postcode _____ Country _____

☐ I enclose my cheque /money order for $AUD _____

(required in Australian dollars drawn on an Australian bank and made payable to 'Australian Alpaca Association Inc')

☐ Please debit my credit card for the amount of $AUD _____

(Min. transaction amount for credit card payment is $AUD 15.00)

☐ Mastercard ☐ Bankcard ☐ Visa

Credit Card No

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐

CCV No ☐☐☐ (Credit card verification (CCV) - the last 3 numbers on the signature strip on the back of your Credit Card)

Expiry Date / /

Name on Credit Card _____

Signature _____

Send to AAA P.O. Box 1076, Mitcham North, Victoria 3132, Australia
Fax 03 9873 7711

Whichever way, we're worth getting to know!

Alpacas for the discerning

PUCARA
ALPACA STUD

Jude Anderson & Alan Cousill • 400 huacaya, suri and suri crosses... 80 for sale
Managers: Alan & Fiona Buckland 0407 098 286 for all enquiries
Torquay, Victoria • 03 5263 3436 • pucara@bigpond.com
www.pucara-alpacas.com.au

Preparing Suris for Showing

AN ARTICLE FOR NEWCOMERS TO THE SHOW RING

SURI ARTICLE compiled by **Angela Preuss** > AAA Suri sub-committee

Showing is not all about winning ribbons. The benefits from attending shows are many. Suri breeders are a relatively small and united group within the industry. Entering suris in a show creates a terrific opportunity to talk to other suri breeders, see many suris in one place, learn a lot and really feel part of the industry.

Suri Line up at the 2005 National Show

Now that Christmas and New Year are behind us, the Suri sub-committee would like to encourage more suri owners, (especially smaller breeders) to show their suris in 2006. Given that suris make up less than 10% of the Australian alpaca population it is understandable that suri classes in most shows are small. At this early stage in the suri industry's development showing is one of the most effective ways of promoting the breed.

If we look at the lessons learned from the huacaya breeders it is evident that as more animals, particularly coloured animals, appeared in the show ring, interest in breeding them grew rapidly with more and more people entering the industry. So one of the best things you can do to promote your own stud and the suri industry as a whole is to get out there and show, even if you don't think you have this year's Supreme in your paddock!

Now is the time to have a look at your suris and identify one or hopefully more that you would like to enter in shows this year.

Don't despair if your once beautiful suris look like a pile of dried grass and burrs after the long, hot summer months.

Fortunately suris take little time and effort to clean up and to have looking very 'showy' quite quickly. Compared to huacayas, suris are relatively easy to prepare for shows and don't need the trimming procedures which huacaya often require.

If you haven't shown your suris before, then a good place to start is at your Region's smaller shows. These shows have a relaxed, friendly atmosphere and there is always plenty of help at hand if needed.

The shows are advertised on the Regional web sites, in Regional newsletters or information can be gained from your Regional Secretary.

Following is a brief procedure for preparing suris for showing. This article does not cover halter training, which is another article in itself!

Step 1 Straight from the paddock

In an ideal world, alpacas should be kept on lush, green pastures to keep their fleece clean for processing and showing. However, if you are like the majority of alpaca breeders in Australia, then your animals are out in the paddocks, rolling and collecting dry vegetable matter in their fleece. Don't despair and think that it is an impossible task to get them clean and ready for a show. Fortunately it is a relatively easy task.

Don't despair if your suri looks like this after the long, dry summer!

Step 2 The initial clean up

If possible, bring your show suris into some yards about a week before the show, for an initial 'clean up'. If you don't have time for this, then a couple of days before will be sufficient.

The rule for preparing suris for showing is 'less is best'. The aim is to remove as much vegetable matter as possible, without disturbing the lock structure, so that the fleece can be opened easily by the judge. If the locking is pulled apart too much in order to remove vegetable matter, it will disturb the structure of the lock and cause loose fibres. These loose fibres will only encourage the collection of more vegetable matter, as well as cross fibreing and matting of the fleece. Remember that only 5% of total points are awarded for presentation, whereas 65% of points are awarded for the fleece, so do not 'over-prepare' a suri to the detriment of the fleece.

The best device for the clean up is a dimpled rubber horse mitt (glove), which can be purchased from rural suppliers for under $10 each.

Either have someone hold the suri or tie the lead to a secure point. With the glove on your hand and using firm pressure, comb downwards from the backline part. After a few strokes, remove the loose fleece and vegetable matter from the mitt. You will be amazed at how much the mitt collects. Repeat this process on the other side of the suri and on either side of the rump. Comb down either side of the part on the back of the neck and down the front of the neck.

You will be amazed at how much loose fleece and vegetable matter is collected on the rubber mitt.

After this procedure, you will notice that the majority of the vegetable matter has been removed. You will also notice, especially on darker colours, that this combing will bring the dust to the surface and give the suri a dull look.

The more stubborn vegetable matter, such as clover burr and grass seeds, will need to be removed by hand. With your fingers spread, 'comb' your hand in a downward movement from the backline. When you feel a piece of vegetable matter, squeeze it between the thumb and finger, hold the bottom of the lock secure and gently remove the item. You may need to lift up the outer layer of fleece to remove stubborn vegetable matter from the fleece close to the skin.

While the long fringe on the suri looks attractive, it often impedes their eyesight. Suris are renowned for being 'jumpy' in the show ring. Most of this is probably attributed to the fact that they get a fright in this unfamiliar place, as they can't see the judge and stewards approaching. To avoid this, the fringe can be trimmed carefully above the eyes or 'windows' can be cut into the fringe around the eyes. If trimming the locks under the fringe make sure you leave the top layer looking natural. There is no quicker way to destroy the look of a suri's head than chopping the fringe straight across. ➤

After the initial clean up. Notice the dust on the surface of the fleece.

Step 3 The hose down

While huacaya breeders would freak at the thought of hosing down a show huacaya, suris really do benefit from a good drenching. Most people who own suris would notice how fantastic suris look after a shower of rain. They simply glow in the paddock, look really clean and the lock structure and character looks terrific.

Without the nozzle attached, hose the suri downwards from the backline and down the neck and then put the animal somewhere clean to dry off.

The suri after being hosed down

Step 4 Before the show

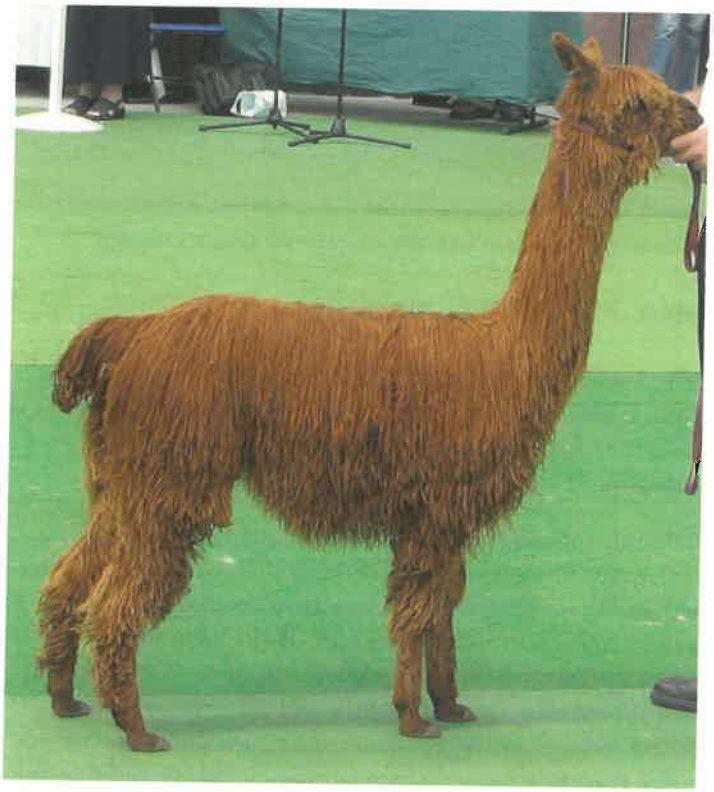
After the hose down (a couple of days before the show) it is best to leave the fleece alone until the show day. During this time it is optimal if the suri can be placed in a clean area where it will not roll.

This could be in a pen with clean bedding straw, on the lawn or on slatted floor in a shearing shed.

The fleece is now ready for the show

At this stage it can be helpful to put together a small 'show kit' of necessary items including:

- Feed and water containers
- Bucket for collecting water
- Some hay or chaff mix (food that they are used to)
- Some type of equipment to pick up the soiled straw (plastic garden hands, pooper scooper or just plastic bags will do)
- A white coat and black trousers / skirt (check to see what attire is necessary for that particular show)
- Rubber mitt
- Spray bottle
- Halters and leads



Looking good at the show

Step 5 At the show

At most shows the suris are now shown first thing in the morning, before the huacayas. Therefore, after your animals are penned, it is a good idea to give them a final clean up while waiting for the vet inspection.

Many breeders will not provide food or water for the animals on show day until after they have been shown. This is a personal choice, but they certainly can go that length of time without food and water, both of which can make final preparation harder as the feed gets in their coat and they will often get very wet necks from the water trough.

The rubber mitt will remove any bedding straw and other vegetable matter. A fine mist of water from a spray bottle will then settle the fleece down. Spray the suri lightly, and gently comb down the fleece with your fingers. Then leave the suri alone until called to the marshalling area.

Use this time to grab something to eat and drink before the show begins.

There will be a short exhibitor's meeting before the showing begins. The suri judging starts immediately after the stewards' meeting. Follow the steward's directions as to where to walk and stand in the show ring.

During the judging, listen to the judge's comments to hear what criteria they are looking for in the winning suris.

Step 6 After the show

One of the greatest benefits of showing can be gained after the judging is complete. Use this time to talk to other suri breeders and most importantly to look at other suris. When the owners of the winning suris are at their pens, introduce yourself and ask them if you can look at their suris. On inspecting their animals, you will hopefully see the qualities that the judge was commenting on.

This is a great opportunity to look at a lot of suris all in one place and an effective way to learn more about the qualities to be breeding for. Don't be afraid to ask other breeders to also look at your suris as well.

Most importantly, showing should be fun and an experience that enhances your involvement in the industry. Through showing, you not only learn a great deal about the animals, but also about other suri breeders and suri genetics. Showing is also a great opportunity for other suri breeders to become acquainted with you.

A small sign, with your name and stud name, will be very helpful in 'putting your name out there'. Name tags can also be very effective. The suri industry in Australia is still small enough for new breeders who put in some effort, to really stand out from the crowd. Taking your suris to shows helps you to make the most of your initial investment, by networking, learning and experiencing.

The Suri sub-committee understands that showing animals can be a daunting experience for new breeders and would like to offer their assistance with advice on upcoming shows, choosing their show suris, completing entry forms, halter training, fleece preparation, show procedure, etc.

For further information please contact the AAA for the details of members of the sub-committee. We will endeavor to help new suri breeders by answering questions and offering hands-on assistance where possible. ■

The 'Staggers Project'

A SURVEY OF THE IMPACT OF SOME PASTURE-BORNE TOXICOSES IN AUSTRALIAN ALPACA HERDS

RESEARCH UPDATE from the **Staggers Project Working Party,** AAA Inc. Research & Development Sub-committee

- Mark Gishen – Shingleback Ridge Alpacas, PO Box 69 Hahndorf, SA 5245.
- Kylie Munyard and Natalia Sampaio – School of Biomedical Sciences, Curtin University, GPO Box U1987, Perth, WA 6845.
- Kevin Reed – Department of Primary Industries Victoria, Private Bag 105, Hamilton, VIC 3300.
- Daphne Gregory – Chiverton Alpacas, PO Box 496, Cowes, VIC 3922.
- Mel Brown – Ausmara Alpacas, 39 Gordon Gve, Menzies Creek, VIC 3159. Member Research and Development sub-committee, Australian Alpaca Association.

Articles in previous editions of both the South Australian Region and the National newsletters [1,2] have described the preliminary research proposal to investigate the causes and impacts of a pasture-borne toxicosis (i.e. perennial ryegrass staggers) on alpacas that was submitted to the Rural Industries Research and Development Corporation (RIRDC) for research funding in 2004-2005. The proposal was set aside, in part because anecdotally "only small numbers show clinical signs" and that "affected breeders seem to be able to manage the problem adequately at present". Common management of these types of problems involves removing animals from toxic to 'safe' pasture or to a bare 'recovery' yard (as shown below) for hand feeding – these can be expensive to set up and run.

An example of a bare 'recovery' yard used to allow clinically-affected alpaca to recover from perennial ryegrass 'staggers'.

A previous survey in Victoria (conducted in April 2001) initiated by a dedicated group of breeders and veterinarians in collaboration with Dr Kevin Reed, Victorian Department of Primary Industries, Hamilton, reported that nearly 75% of respondents (n = 44) reported ryegrass staggers clinically affecting between 5% and 10% of their alpaca [3].

However, clinical effects may be much less important than sub-clinical effects which can reduce feed intake, reduce growth rates, lower reproductive efficiency (e.g. neo-natal losses) and reduce milk production [4].

At a recent symposium [4], it was shown that costs (direct) of perennial ryegrass toxicosis to the sheep industry in Victoria for the year 2002 exceeded $30 million. In the USA, the annual cost of tall fescue endophyte toxicosis (caused by similar toxins to those produced by the perennial ryegrass endophyte) to the beef industry is now estimated at $US1.6 billion.

What are the costs to the alpaca industry? To do this it is necessary to extend the previous survey work [3] in order to evaluate the problem in a national context. In response, the Research and Development sub-committee of the Australian Alpaca Association decided that there was a need to obtain more detailed information on the prevalence and impact of various pasture-borne toxicoses, including perennial ryegrass staggers and sporidesmin (facial eczema), on alpacas in Australia.

The R&D sub-committee established a working group, comprising the authors of this report, to set up and conduct a survey throughout Australia. The project is now underway, with the survey being conducted by Natalia Sampaio, a student at Curtin University, under the supervision of Dr Kylie Munyard, Associate Lecturer in the School of Biomedical Sciences at Curtin.

Progress in the project

The scope of the project is to conduct a survey, using appropriate techniques and procedures, to estimate the prevalence and severity of some pasture-borne toxicoses (fungal), especially perennial ryegrass staggers, in Australian alpaca herds.

The working party prepared a survey and conducted a preliminary trial with ten AAA members randomly selected from the AAA's most recently published Breeders Directory.

Following some refinements to the survey form, the survey proceeded with further members again randomly selected in a similar manner. The minimum number of breeders to be surveyed will be 100 out of a total of nearly 1800 members. Whilst the survey is not yet complete, it has received strong support from breeders with a response rate over 70%. The final results will be collated and analysed soon, and will be presented at the AAA National Conference to be held in Adelaide on 18-20 August 2006.

Some of the expected outputs include:

> Estimation of the prevalence of fungal toxicoses on the basis of:
  - Proportion of AAA Regions affected
  - Proportion of affected herds within each Region
  - Proportion of affected animals within each Region
> Estimation of the severity of toxicoses on the same bases as above.
> Estimation of the cost to the alpaca industry of various toxicoses.
> Evaluate the appropriateness of current management strategies to deal with and overcome the various toxicoses.

One of the most important outputs of this research will be a description of the extent of the problems in Australia. That knowledge will aid in setting priorities for future work such as evaluating solutions with targeted research and furthering the recognition and management of the problems within appropriate Regions' needs. Outcomes for the industry that are expected to emerge include:

> A wider, objective appreciation of the prevalence and relative importance of toxicoses in Australian alpacas. As already stated, this will help identify the most frequently encountered problems of these types facing the industry.
> Information to allow the evaluation of the impact of toxicoses on the viability of the alpaca industry. The real costs of many of these conditions - as well as the benefits from solving them – have not been quantified – it is possible that some are affecting animal welfare and seriously limiting the profitability of some alpaca enterprises.

References

1. Gishen, M. *A proposal for a new research project: A preliminary study of perennial ryegrass toxicosis (staggers) effects on alpacas.* South Australian Region Newsletter, Australian Alpaca Association, Issue 40 (November), pp. 7–9, 14; 2003.
2. Gishen, M. *A proposal for a new research project: A preliminary study of perennial ryegrass toxicosis (staggers) effects on alpacas.* Australian Alpaca Association Newsletter, No. 45 November, pp. 17–19; 2003.
3. Reed KFM, Cummins LJ. *Incidence of perennial ryegrass staggers among alpaca in Southern Victoria.* Western Region Alpaca Group Newsletter no. 50, 15-17; 2003.
4. Reed KFM, Page SW, Lean IJ (eds.) *Perennial ryegrass toxicosis in Australia.* Meat and Livestock Australia, North Sydney. pp 97; 2005.

Staggers - what to look for, what to do

WHAT (SYMPTOMS) TO LOOK FOR:

In order of severity:

> Slightly 'glazed' eyes, ears back, humming a bit more than usual (i.e. whingeing).
> Signs of heat stress (e.g. seeking shade, hard breathing with nostrils flaring when inactive).
> Slight tremor of the head that is most noticeable when an animal is stressed or when sitting.
> A noticeable shake and wobble from the base of the neck upwards.
> Uncoordinated gait when walking (i.e. staggering).
> In bad cases an animal can stagger violently, trip over and even fall down.

The symptoms become exaggerated when the alpaca is under any form of stress, including handling and movement.

WHAT TO DO:

There are a number of early stage or immediate actions that might help:

> Remove affected alpacas from the pasture (use companion animals to minimise stress) to
  - a safe paddock (nil or low endophyte grasses); or
  - bare 'recovery' yard and feed hay and dry feed mix - beware that hay made from toxic pasture will most likely be toxic (this can be for long periods of time whilst the pastures remain toxic).
> Anecdotally, the following may assist in aiding recovery from staggers:
  - Vitamin B-based injections or drenches.
  - Drenching with products claimed to stimulate excretion of the toxin.
  - Adding absorbents to dry feed (there are some commercially available products that are claimed to absorb the toxins). ■

Clyde Haldane Remembered

INDUSTRY ARTICLE by **Eric Hoffman**, USA

Clyde in Chile

Clyde Haldane was instrumental in expanding the alpaca business to places outside South America.

Clyde and his brother Roger have been described as being as pivotal to the alpaca business in Australia as the Wright brothers were to aviation.

Clyde Haldane was a silent giant in the alpaca business. It is not likely that most camelid breeders will recognise his name. However, breeders need only look as far as their own pastures to see his influence.

His recent death provides a moment for us to look back at the small group of risk taking entrepreneurs who started moving large shipments of alpacas from South America to Australia, North America, New Zealand and Europe in the 1980s. Other key figures like Tom Hunt, Jurgen Schulz, and Phil Mizrahie were also on the scene but Clyde Haldane was the first large importer to bring a comprehensive knowledge of fibre and livestock to alpaca exportation. His animal selection methodology and penchant for detail influenced many of those around him.

I first met Clyde in 1985. He appeared at my doorstep in Santa Cruz, California via a Greyhound Bus. At the time there were only two large imported source herds of alpacas in the United Sates. One was owned by Tom Hunt and Jurgen Schulz of Camelids of Delaware Inc., known in the business as CODI. The other belonged to Pet Center, owned by Phil Mizrahie, David Mohilef and Alex Perrinelle. Clyde came to our farm because I sold CODI's animals during the 1980s. He was the first Australian alpaca client any of us had met. He was from rural, coastal Australia where he and his family were well known for pioneering the tuna and prawn fisheries in the oceans off South Australia.

When I think back to our first meeting I remember thinking Clyde appeared too naive to handle the Byzantine and sometimes Machiavellian world of international animal export - a world where the art of politics, large sums of money, tweaking scientific protocols, setting up quarantines, and knowing the right people all came into play.

As it would turn out I was naive in my assessment of Clyde. He met the alpaca export challenge, and then some. This tall, lanky, unassuming countryman possessed intelligence, perseverance, modesty, pragmatism and a ready sense of humour. While he had a keen knowledge of animals in general, he was well informed on fleece-bearing animals in particular. I did not realize at the time that Clyde was already a veteran of commercial livestock farming, international animal importation and award winning wool and mohair fleece production. Since the 1970s Clyde had classed the brothers' "Gleneagles" wool, which became one of South Australia's premium clips, twice topping the Adelaide wool sales. By the early 1980s the brothers were producing the largest mohair clip from a single grower in Australia. In a search for better genetics Clyde had visited America and South Africa. The Haldanes were involved in the first live importation of Angora goats from Texas and Angora and Boer Goat embryos from South Africa to Australia. Around this time Clyde became aware of another fleece bearing animal - alpacas - and began looking into how to bring about a large-scale importation to Australia. Since no protocols existed between Australia and any South American countries, the search started in America. Our crossing paths would prove to benefit both of us in different ways.

Much like me, Clyde turned out to have a strong adventurous streak and fascination with wildlife. These mutual interests would rekindle our relationship when, in the decades that followed, I was assigned to write a natural history guide on Australia by Sierra Club books in the late 1980s. It was Clyde and his brothers who offered much of the logistical help to get me to some of the most remote, awe inspiring parts of their country. It was Clyde who made a gruelling camel trek the length of the arid Flinders Ranges with me in South Central Australia. Clyde was also my companion travelling across the seemingly endless Nullarbor Plain, exploring the labyrinth of caves where the remains of prehistoric animals had been found.

But back in 1985 Clyde was just this guy from Australia who was intensely focused on learning about alpaca husbandry needs and fibre growing capabilities. Clyde hung around our farm for a week and went to the International Llama Association Conference with me, which was held in Yakima, Washington that year. (This was before there was an alpaca association; the alpacas were a small sidebar to the bigger llama conference.) Clyde and I travelled in a mini bus stripped of its back seats to make room for three alpacas that we displayed at the conference and used in a presentation I had been asked to give. We stopped along the way to photograph wildlife and let the animals out to exercise and relieve themselves.

Clyde was the first person I heard ask questions that today seem quite obvious. I remember him asking, "What is the average fleece weight for an alpaca? What is the micron range? What diseases do alpacas resist and what are they apt to contract? How do alpacas handle stress? Can alpacas adapt to new environments unlike their high, cold night pastures in the Andes?" At the time some of the literature about alpacas said they could only live in high elevations. Clyde was interested in an animal that would produce a viable fleece end product. On our drive back to California I asked him what he thought of the well-attended llama conference. "Amusing," said Clyde. I took this to mean he had something else in mind.

Shortly after returning to California I sent Clyde to the Pet Center in Los Angeles - the other large alpaca importing entity operating in the US at that time. Clyde and Phil Mizrahie, the Pet Center's most active partner in camelids, developed an instantaneous friendship and business relationship. Both Phil and Clyde described a sequence of events that went something like this:

Upon arriving in L.A. Clyde promptly bought ten alpacas for a large sum of money. A couple of weeks later when Phil and Clyde were able take a better measure of one another Phil rethought how the Haldanes' investment could be better applied. Phil gave the Haldanes their money back and he took back his alpacas. Instead of a seller/retail buyer relationship, the Haldanes and the Pet Center formed an export partnership that would have far reaching effects on would-be alpaca owners around the globe for decades to come.

The animals (and now their lineages) exported by this partnership are standing in pastures in Australia, New Zealand, the United States, Canada and to a lesser extent Europe. Phil Mizrahie revered the Haldane brothers: "The Haldanes were great friends and superb partners. They are honest, smart and know how to get things done. Roger is better known, but Clyde was the one who spent months on the altiplano getting to know the herds and selecting animals based on his own criteria. He wasn't interested in mass purchases as much as he was in selecting an animal based on its merits. He was a unique person who will be sorely missed by everyone who knew him."

The Haldanes, working with the Pet Center, were everywhere in the rapidly expanding alpaca world of the late 1980s and early 1990s. Only the CODI group matched them in developing protocols between nations, and in sheer numbers of alpacas exported from South America during those years. At times these two groups joined forces to complete some importations, most notably the first large exportation from Peru to the United States in 1993. Clyde Haldane was one of the main purchasers of alpacas for the first two shipments into the United States. Spheres of influence developed. The Haldanes and Pet Center became leaders in developing the New Zealand and Australian markets while CODI was more focused on developing the North American market.

The Haldanes helped open New Zealand in the late 1980s with a shipment of 350 animals, which were part of a 1,100 animal import. The importation was unique because it was done by a large seagoing freighter and took nearly eighty days to complete. Following that, the Haldanes convinced the Australian government to allow alpacas to enter Australia as a form of livestock. They were initially allowed only into the state of South Australia. Shortly after this was accomplished, Australian Geoff Halpin imported a small group of alpacas from Alaska.

This was followed by a series of large shipments, each numbering in the hundreds in each group. Occasionally the Haldanes teamed up with other importers including Alan Hamilton, who was a major supplier to both the Australian and English markets. The Haldane/Pet Center group was the first to use the Cocos Islands in the Indian Ocean for a quarantine facility prior to entering Australia. Later, importers including Pat Viceconte would add to what the Haldane/Pet Center and Hamilton efforts imported. Today the national herd in Australia is in excess of 60,000 animals, many of which can be traced to the Haldane/Pet Center's initial importations.

While the movement of animals was creating a stir and much newsprint, Clyde Haldane stayed out of the limelight, while doing a great deal of animal selection in South America. He spent about four months of each year from 1988 to 1992 in South America. He would go to great lengths to find animals and often stayed in remote villages working with the Quechua and Aymara herders and sharing their primitive homes. ➤

Clyde with Don Julio Barreda

On these mammoth sojourns he visited most of the major breeders operating in northern Chile and Peru. He certainly had his share of memorable experiences. Once, he heard that a group of herders who lived in a remote area inaccessible to motorised vehicles might have some good animals. He managed to contact the isolated villagers through a relay phone and told them to watch for smoke coming from the far end of a huge dry salt lake that spanned nearly twenty miles. This would be their signal that Clyde was there with a truck ready to make purchases.

Clyde arranged for a truck, arrived at the lake and lit his fire. By day's end he saw the smoke signals from the villagers. Two days later a herd of 200 alpacas appeared on the horizon seeming to float across the shimmering mirage of the inch-deep lake. Clyde recounted that two rheas (the large flightless ostrich-like bird of the Andes) scurried ahead of the herd as it approached.

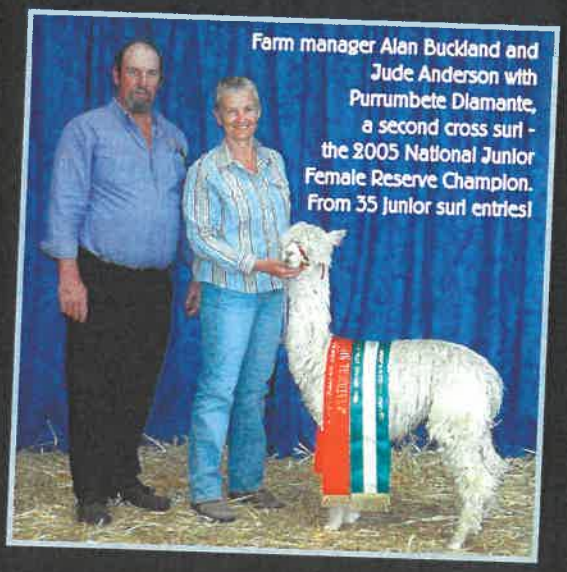
Clyde held animals to exacting standards on his buying missions. He would sometimes look through an entire herd and not buy an animal while other days he would buy a dozen or more. I have also travelled to many of the remote areas visited by Clyde such as Macusani and Rural Alianza in the years since his last visits. Many of the locals still fondly remember him. They affectionately describe a tall man from Australia who stayed in their villages for weeks at a time and always brought his own cereal. By the mid 1990s the alpaca business was changing. The quarantines and protocols were standardised and had become workable situations. Screening and registration requirements were in place to ensure animal quality, and a new group of exporters was on the scene moving animals to the far corners of the world. By 1998 the North American alpaca registries (ARI and CLA) had been closed to imported animals.

Clyde and Roger Haldane are visionary men and pioneers. Clyde thrived on the puzzle presented in introducing unique animal species to new settings. In 2002 the brothers were still successfully raising alpacas, but their curiosity about other poorly understood animals was getting the better of them. In another first of its kind importation, they imported a rare breed of milking buffalo from Bulgaria and Italy to Australia. Today Roger Haldane oversees a large dairy operation with these immense but gentle bovines producing awarded winning yoghurt and cheeses. Clyde became fascinated with Icelandic ponies, the "Viking horse," and imported a sizeable herd, creating a rare genetic repository for the breed in the Southern Hemisphere. He also began working with relatively rare French breeds of dairy cattle that he believed would produce healthier milk products. Even as cancer limited his activities, Clyde held out hope. He imported an Icelandic stallion just months before he died.

I last saw Clyde a year ago on his farm in Australia. He introduced me to his herd of ponies and spoke of his plans to train and sell them - he saw these beauties as an ideal horse for children. We talked about our past adventures and compared notes on remote parts of the altiplano we had both visited, but never with one another. Clyde felt good about his contributions to the alpaca business in Australia and abroad and told me to tell his old partner, Phil Mizrahie, that he was happy. Clyde Haldane's journey on this earth helped define the alpaca business on three continents. He leaves behind a valuable and ongoing legacy. Thank you Clyde. ■

Editor's note: *This article is reproduced with the kind permission of the author and Alpaca World Magazine, UK.*

Why worry about purity when you have quality!



Farm manager Alan Buckland and Jude Anderson with Purrumbete Diamante, a second cross suri - the 2005 National Junior Female Reserve Champion. From 35 junior suri entries!

Suri crosses for the discerning

PURRUMBETE SURI CROSSES

Alan Cousill, Jude Anderson & Chic Wilson with managers: Alan & Fiona Buckland
Torquay, Victoria • 03 5263 3436 • 0407 098 286 • pucara@bigpond.com
www.pucara-alpacas.com.au

Application of Brass IAR Ear Tags

ANIMAL HEALTH AND WELFARE ARTICLE by by **Dr Richard Dixon** B.V.Sc., > Berridale Alpacas, NSW
AAA Inc. Animal Health, Husbandry & Welfare Sub-committee

Many thousands of Australian alpaca now sport IAR tags and their breeders report no troubles, however recent postings on the AAA Inc. Discussion Forum are yielding the odd occasion when breeders have run into some trouble. To assist breeders who are new to the industry or those who have got into a spot of bother, following are step by step instructions and handy hints for the application of the brass ear tags.

At what age do you tag animals?

I recommend the IAR brass tag only be applied to animals 6 months of age or over. The problem with applying the tags to younger animals is that the ear is narrower and there is a far higher chance of piercing blood vessels; thus leading to infection and future problems. At 6 months (coincidentally, general weaning age) the alpaca's ear is of sufficient size to reduce that possibility.

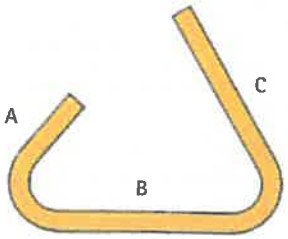
The tag

The IAR brass ear tags provided by AAA have three sides.

> SIDE A is the shortest and is the side that pierces the ear cartilage when the applicator pliers are squeezed shut.

> SIDE B is the longest and has the letter IAR embossed in the middle of the outside. (This is the side that should end up on the outside 'hairy side' of the ear.)

> SIDE C has the individual ear tag number embossed on its outside. (This is the side that should end up on the inside 'smooth side' of the year.)



Editor's note: *These descriptions have been written based on the IAR ear tags that bear five (5) digits only.*

The ear tags currently being issued by AAA now have six (6) digits. The first two digits of the ear tag number are embossed on SIDE B (i.e. the side that also has IAR embossed on it); the remaining four digits appear on SIDE C. When the ear tag is closed the numbers should appear consecutively.

This fact does not alter the ear tag application process.

Won't having the ear tag number (SIDE C) on the inside of the ear make it hard to read?

Yes it will, however if you insert the current model of the IAR tag leaving the number on the outside of the ear (where it's easily read), the ends of the tag that overlap each other when the tag is clamped shut will also be on the outside of the ear. This makes for a very effective way of trapping the tag in wire when the alpaca puts his/her head through the fence. The alpaca is subsequently caught in the fence until either you release it, or the animal tears its tag out of its ear! By inserting the current model of IAR tag with the number on the inside of the ear, there is only the smooth side (SIDE B) to slide past the wire.

The applicator

Unlike many other identification tags, the AAA ear tags are designed to be self-piercing and to be used with an applicator called a 'One Shot Applicator', made by Allflex Ltd. and which are also available from AAA.

Which ear for which sex?

> For female alpaca, the tag is inserted on the outside edge of their RIGHT (starboard or off side) ear.

> For male alpaca, the tag is inserted on the outside edge of their LEFT (port or near side) ear.

In moments of indecision simply remember that, "the lady is always right!!!"

Steps for applying the ear tag

1. Disinfection

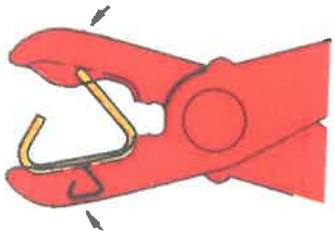
Methylated spirits, Betadine, Chlorhexidine, or any skin disinfectant would be satisfactory.

Armed with a cotton wool ball soaked in the disinfectant of your choice; rub both the inside and outside of the ear to remove any scurf, loose hair and bacteria.

Some people report shaving a small area of excessively hairy ears and also soaking the IAR tag in disinfectant prior to application. This is all fine, as long as the ear is rubbed with the soaked cotton wool before applying the tag as this is far more effective than spray.

Disinfection is very important, as infected cartilage is almost impossible to cure without surgery which may result in removal of part or all, of the ear. Should infection set in or a discharge occur, it would be advisable to cut the tag with side-cutting pliers and remove it. In the presence of infection, the ear tag is just another foreign body and may delay healing. In any event, prevention is better - and cheaper - than cure!

2. Loading the applicator



On both sides of one jaw of the applicator is a raised symbol indicating the correct way for the tag to be loaded into the applicator.

A handy hint is to use some white paint or liquid paper on this applicator jaw.

When you are applying the tag, it is the jaw with the raised symbol (white paint) that will be on the OUTSIDE 'hairy side' of the ear.

3. Where to stand when applying the ear tag

Being right-handed, I find it easier to stand behind the head of the female on her right side. When applying the tag to males, it is easier to stand on their left side and in front of their head. (Left-handed folk might like to reverse their stance).

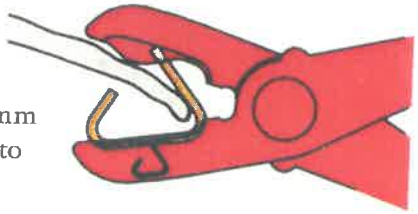
Remember to keep the raised symbol / white painted side of the applicator jaw on the outside 'hairy side' of the ear.

4. Applying the ear tag

How far up/down the ear?

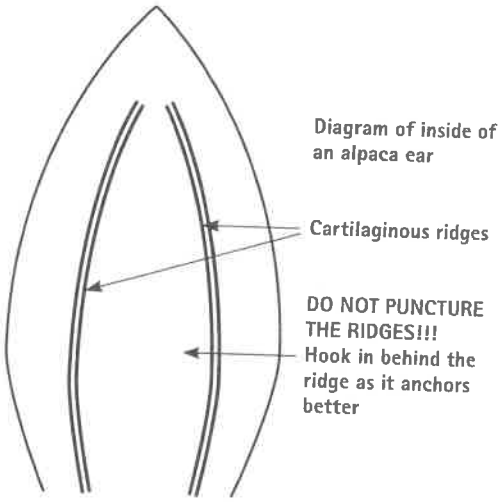
Place the applicator halfway between the tip and the base of the outer edge of the ear (when the ear is facing forward).

How far onto the ear?



In the curve of the tag between SIDES B & C, allow approximately 1-2mm from the edge of the ear to that curve.

Why? If you push too far onto the ear the resulting pressure of the tag on the ear cartilage may cause irritation or inflammation; if you leave too much of the tag protruding past the edge of the ear, it will leave space for long grass, twigs or ends of wire to get caught. One exception is if you plan to attach a plastic ID tag to the brass one where this may require you to leave approximately half the tag protruding past the ear margin.



Application

Having located the desired area, apply the tag with one firm squeeze of the applicator if possible. If you have to use two squeezes, make sure that the applicator has not slipped (even slightly) on the tag.

The design of the applicator ensures that when the tag has been applied properly there is no pressure on the enclosed section of the ear. If the applicator slips on the tag and the second squeeze is on the middle of the tag, the resulting pressure on the enclosed ear will cause continuous pain and may lead to infection.

Of course the procedure of tagging ears would be far more easily demonstrated than explained, so for breeders who feel a more hands-on approach would be appreciated, consider talking to your Regional committee about arranging a demonstration day for husbandry procedures, or even just a tagging demonstration at your next Regional event. ■

The most highly awarded alpacas in Australia have one thing in common

National Champion Huacaya, 2005 'Banksia Park Khan ET'
Sire: JOLIMONT WARRIOR
Congratulations to Jenny and George Jackson and their family
SOLD National Auction $170,000

National Champion Huacaya, 2004
JOLIMONT WARRIOR

National Champion Huacaya, 2003 'Blue Grass Centurion'
Sire: JOLIMONT WARRIOR

JOLIMONT WARRIOR

Proudly owned by Ambersun Alpacas and Ichiban Alpacas

Available for monthly mobile servicing (September through to June)
in Victoria, NSW, ACT and South Australia.

Service fee $1,750 (incl GST)
'Live cria' guarantee (Conditions apply)

Enquiries – Contact: Chris Williams 0417 826 762

Fine Choice Peruvian Travolta Solid White

Just arrived from the Macusani Region of Peru

Fibre statistics (6 yr old): **20.0 micron, SD 4.0, CV 19.8%** (Southern Tablelands Fibre Testing 2005)

Available for monthly mobile service (SA, VIC, NSW, ACT)

At your service

Fine CHOICE ALPACA SERIES

Phone Chris Williams 0417 826 762

Alpaca at the Wool Fashion Awards

FASHION ARTICLE by **Bronwyn Mitchell** > Glenhope Alpacas, NSW

Alpaca has been highlighted at *The Australian Wool Fashion Awards* (TAWFA) and many high profile venues throughout Australia over the past year.

The gala event was held in Armidale, NSW in March 2005 with over 450 people attending the evening for the presentation of the awards.

From the 350 entries, 110 were chosen for the parade with all four alpaca garments making it to the catwalk. The men's suit received a second place and medallions were awarded to the dress entered in the race wear section and also to the collection of garments.

Macquarie Textiles produced the fabrics used for all the garments consisting of 70% wool and 30% alpaca blend. It was most interesting to see the vastly different end products created by the four designers that all looked sensational on the night.

Rita Scholl, who is involved in fabric retail and fashion designing, created a very chic collection of outfits in black and white houndstooth fabric.

The same fabric was used by Josette Simon to produce a very sophisticated race wear outfit reminiscent of the 40's style. Josette, who now lives in Brisbane, is French and has worked as a pattern maker with many famous fashion designers in France and Italy.

Sue Hammond, entering the awards for the first time, received a second place for her smart men's suit made from the black fabric.

The same fabric was transformed by Susan Thompson into an elegant evening gown and jacket.

The garments are judged on both fashionability and workmanship so all entrants are to be congratulated and thanked for creating such a wonderful collection of garments to assist in the promotion of the alpaca industry.

Throughout the year the collection has been on catwalks around Australia at events such as *The International Wool Textile Organisation* held in Hobart; *Queensland Sheep & Wool Show* and the *World Shearing Titles* in Toowoomba; and at various shows and field days including *Sydney Royal* and Wagin and Dowerin in Western Australia.

The main aim of the competition is to educate and encourage young designers in the wonderful qualities and versatility of wool and wool blends. The rewards include significant cash prizes, opportunities to work with leading Australian Fashion Designers and scholarships for students to study at recognized Fashion Institutes. More information about TAWFA can be found on their website *www.tawfa.com.au*

The alpaca garments will now be used by the Central Coast & Hunter NSW Region to further promote alpaca at such events as *Wool Expo* in Armidale on 13-14 May 2006 and at *Alpacas on Parade* to be held at Maitland Showground in June. ■

We Will All Improve with AGE

RESEARCH AND DEVELOPMENT ARTICLE by **Dr Pierre Baychelier** > Alcazar Suri Stud, NSW

I recently attended a few workshops about our new Across-herd Genetic Evaluation Project (AGE) and, when discussing with my fellow breeders, I was surprised to find how this new, potentially powerful selection tool was actually misunderstood. I have therefore decided to put a few words together to share my experience of this new service.

Maybe I should start by saying that I am not on the AGE working party, only a simple user of the service.

I suspect that there are still some breeders out there who do not fully understand the difference between phenotype and genotype. I will not repeat the definitions of both concepts here, but it may be worthwhile to explain that the genotype is actually made up of two very different components:

$$G = GCV + BV$$

The genotype (G) is made up of the gene combination value (GCV) and the breeding value (BV). The GCV is not heritable and is responsible for hybrid vigour and inbreeding depression, which are just the two opposite facets of the same thing. I have already discussed these concepts in a previous article [1] and these are not the topic of the present article.

The breeding value is what the AGE is all about. The breeding value of an animal is its value as a parent, or more precisely as a genetic parent. It has little to do with 'being a good mother', it is rather the genetic parental value of the animal. The breeding value is this part of the genotype that is passed to the progeny. It is heritable. Hence the name: breeding value.

Obviously, the breeding value cannot be seen on the animal. It has little to do with the phenotype of the animal. It is seen and assessed in the progeny of the animal. So, one could think of the AGE as a pair of X-Ray glasses, which allows the breeder to see what is inside his/her animals. It would have to be a very powerful pair of X-Ray glasses though, as we are talking about the genetic make up. This analogy is just trying to explain that we are not interested in the appearance or performance of the animal (i.e. its phenotype). All this is the domain of the show scene or the fleece market. Under the AGE, what the animal looks like is largely irrelevant. What is important is what its progeny looks like. This is the breeding value of the animal.

Moreover, the breeding value of an animal also tells us what its future (yet unborn) progeny is likely to look like and perform. So, it is not only X-Ray glasses we are using, but also a powerful crystal ball.

As a result, when participating in the AGE, it is much more important to send data about the progeny of a given animal, in order to calculate its breeding value, than to send data about the animal itself. It is nonetheless useful to send data about the animal's own performance, especially for young animals or for females, who typically have less progeny than males, but it is not necessary to send data about the same animal year in, year out. This is not the purpose of the AGE. Keeping records about the same animal over time is good practice but of little use to the AGE. You do not need the AGE to assess the 'value' of your animal by monitoring its fibre diametre (for example), shearing after shearing. An animal with a very constant fibre diametre from one shearing to the next is 'valuable' but this certainly does not reflect the breeding value of the animal. There is another tool available to assess this kind of consistency: it's the show scene. Winning ribbons year after year with the same animal is a measure of its consistency. But it has little to do with its breeding value.

On average, it would be expected that data recorded at 1 or 2 years of age and again as an adult would be sufficient for the majority of animals enrolled on the AGE project. As long as one makes sure that data from all the progeny of a given animal is sent, as far as possible, then two or three sets of data for each of its sons and daughters should be sufficient.

How are we to use these figures called 'breeding values'? Let us go back to the crystal ball analogy. The most useful practical application of breeding values appears in the following calculation: The progeny's own phenotype will be the average phenotype in the population, plus half the breeding value of the sire and half the breeding value of the dam. This means that we can predict the phenotype of the progeny, when knowing the breeding values of the parents. It also means that it is very valuable to have the breeding value of the dam too. If you know the breeding value of a dam, you can also choose a mate accordingly, either to compensate her weaknesses or to accentuate her strengths. For example, let us assume that the average fibre diameter in the alpaca population is 23 microns and that you plan to mate a female alpaca with a BV of -0.2 micron for fibre diameter to a sire whose breeding value is -0.4 micron for fibre diameter. The fibre diameter of the progeny is likely to be, on average:

$$23 + (-0.4/2) + (-0.2/2) = 22.7 \text{ microns}$$

It then becomes very easy to plan different matings on paper and assess the potential results. It also becomes much easier to find the best sires for your females. The best male for a female is not necessarily the best male overall, but the one who complements her best, according to the breeder's own objectives. There is so much variation out there and so many breeding objectives that one can argue that almost any sire can be a valuable sire. For example, a sire which breeds very fine progeny but with low fleece weight will be ideal for a female producing progeny cutting lots of coarse fleece. This finding is intuitive but the AGE can measure it. The most valuable animal often represents a balance of breeding values for various traits.

There was another concern amongst my fellow breeders, that of confidentiality. We should remember that confidentiality was of the utmost importance to the people who set up the AGE project. Not only are the breeding values of your animals your property but you can participate in the AGE without anybody knowing it, if you so prefer. Personally, I do not see the point: I want everybody to know that I am using the AGE. Breeders should not be afraid of making the breeding values of their animals available to prospective buyers. They do so for show results so why not for breeding values? It is a very powerful marketing tool, used extensively in other animal breeding industries.

The AGE is a non-prescriptive tool. You can use it the way you want. It is just another tool to help your selection decisions, like show results, pedigrees or your personal subjective assessment.

I believe the AGE is cheap and very good value for your money. It is the perfect complement to the expanding technique of embryo transfer and to the emerging technique of artificial insemination.

The use of sophisticated calculation methods *(Best Linear Unbiased Prediction or BLUP)* allows a true Across-herd comparison; a huge plus compared with the initial genetic evaluation techniques. In these early techniques, potential future sires had to be kept together in testing stations, to eliminate environmental influences. The consequence was that only a limited number of sires were available for selection. The dairy industry is still paying for the excess of such early techniques (the infamous 'sire effect').

With BLUP, any male enrolled, or any female for that matter, wherever he or she lives, can be part of the selection process.

We will all improve with AGE! It is a powerful pair of X-Ray glasses with amazing crystal ball capabilities. ■

References

1. BAYCHELIER P. – Are you afraid of inbreeding? *Alpacas Australia*, Issue 43, Autumn 2004, pages 30-32

Tips from the AAFL Classers

FLEECE ARTICLE compiled by **Courtney Wright** > Australian Alpaca Fleece Ltd.

Now that the bulk of the 2005-2006 alpaca clip has been received at Australian Alpaca Fleece Ltd. experienced classers, David Williams and John Hoornweg have put together this list of Dos and Don'ts for next shearing season and beyond.

DO

✓ Through management avoid vegetable fault (particularly with crias), tenderness, overgrown fleece, cotting.

✓ Use only plastic bags to send packaged fleece within wool packs.

✓ It is imperative to skirt fleeces fully until all medullated skirtings are removed. This will avoid skirting contamination of the main fleece and will assist in greater classing capacity – refer to "Points to Watch" at *www.australianalpacafleece.com.au*

✓ Separate guard (medullated) hair e.g. aprons/bellies and pieces from good pieces. Keep short pieces (under 70mm) in a separate bag.

✓ Always fold fleece edge to edge so as to avoid contamination with edge fibre, and then roll fleece up.

✓ If placing more than one fleece in each bag, separate each fleece with a sheet of paper (e.g. newspaper).

✓ Try to combine multiple smaller bags into as few wool packs as possible to help maximise storage space at the AAFL warehouse and also to avoid excess transport costs.

✓ When sending fleece from more than one grower in the one bale/butt/bag make sure to correctly label and separate each clip.

✓ Correct identification of grower(s) needs to be on the inside of the bales/butts/bags as close to the top as possible. Identification must also be on the outside of bales/butts/bags.

✓ Show correct delivery instructions on the outside of bales/butts/bags for transporters.

✓ If storing alpaca take precautions to avoid moth/mice contamination. If sending in old (i.e. years old) alpaca, first inspect for the presence of moths/mice as, if infected, this fleece may become NCV.

- If fleece is infected with moths we cannot risk contamination of other fibre in the warehouse, therefore infected fleece will be discarded.

- If fleece is infected with mice, its destination will be dependent on the level of contamination.

✓ White fibre must be white with no coloured fibre; otherwise it will be classified into a variety of coloured lines. Black fibre must be pure black e.g. if the black fibre has brown tips it is classified as black/brown.

– Please note that the AAFL classing colour range is different to that of the AAA colour chart.

✓ If you are unsure about the handling or preparation of fleece, visit a field day or please contact us to organise a group to visit the AAFL warehouse in Sunshine, Victoria. We are open from Monday to Friday, 9 am to 5 pm.

Identification is not possible until the bag is opened ... but even then sometimes there is no identification included!

DON'T

✗ Do not mix various coloured fleeces in the same bag.

✗ Do not mix colours in skirtings/necks/legs pieces either - please keep separate.

✗ Do not use poly or chaff bags as fleece may become contaminated by small fragments of these materials.

✗ Do not use hay band/string to seal bags. Again fleece may become contaminated by small pieces of string, which is impossible to skirt/class from within the fleece once mixed.

✗ Do not send any foreign objects like clothes pegs, safety pins, false fingernails, socks, eye glasses etc.
(AAFL has quite an extensive lost property department!).

Foreign objects found in fleece bags.

Fleece has become contaminated by shredded chaff bag material.

Your co-operation in these matters is vital and will greatly assist AAFL as the national clip continues to grow.

David and John send their thanks and congratulations to all those shearers, roustabouts, growers, FLOs and other Regional committee members who co-ordinated fleece baling days during the very successful 2005-2006 shearing season.

Your combined efforts are greatly appreciated.

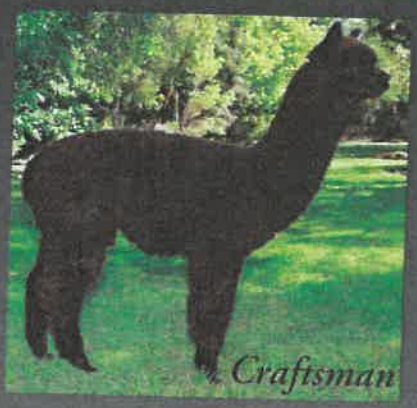
John Hoornweg (left) and David Williams.

WYTERRICA


Pania


Rory


Mossimo


Craftsman

The Ultimate in Coloured
SURI & HUACAYA

Wendy Hart & Ross Delmenico

WYTERRICA ALPACAS, COBRAM

Wyterrica Rory co-owned by Wyterrica Alpaca Stud and Millduck Alpaca Stud

03 58 722 050 - 0408 40 36 02 - 0407 50 30 20

Email: wyterrica@cobram.net.au

Web: www.wyterricaalpacas.com.au

Tasmania's Beautiful Twins

INDUSTRY ARTICLE by **Pearl Anderson & Elod Gunther** > Cameo Alpacas, Tasmania

Twins at the milk bar

Pearl and grandson, Vaughn, giving Belle her supplementary feed

Each Saturday we have a stall at the Salamanca Markets in Hobart which promotes and sells alpaca products. Earlier this year, since we were bottle feeding a young alpaca and were also anticipating a female to drop a cria, Pearl went home early after helping to set up. As expected one of the girls did indeed drop a 9.3kg female cria at 11.30am.

After the 2.00pm bottle feeding (which lasted almost half an hour), as luck would have it, Pearl noticed one of the other females in the paddock was giving birth and she went to observe the proceedings. Inspection revealed the head and legs of a cria had presented along with another 'bag' hanging out. The cria was not breathing. Initially Pearl thought the bag was the afterbirth and that worse still the uterus had prolapsed. However when she felt the bag she felt a head, and proceeded to tear the tough bag open. To her delight another cria dropped out and simultaneously the other baby was delivered, at which time they both started breathing! If she had not been there, possibly one or both could have been lost.

The twins, a boy named *Beau* and a girl named *Belle* weighed 4.1kg and 4kg respectively at birth. In the first few days Beau lost 200 grams as his twin sister was the more aggressive, sticking more closely to her mother, getting more attention and more feeding time from her.

Hence we decided to supplementary feed them both every three hours right from the start. Sometimes they will drink, sometimes not depending on how much they have been getting from their mother. Now two weeks old, Beau has become stronger and more demanding of his mother and weighs 4.6kg. Where once he used to wander away from her and lay down while his sister stuck to her like glue, he now knows better. Nowadays he plays with his sister and stays close to the milk bar too. Belle, having stuck to mum from the outset, now weighs 4.9kg. ■

Alpaca Female Reproductive Physiology

RESEARCH AND DEVELOPMENT ARTICLE by **Jorge Reyna** BSc (Hons), MscVetSC > Alpaca Reproductive Technologies – ART

Introduction

Female reproductive physiology in alpacas has not been studied as extensively as in other domestic species. Lack of research in this area has been due to limited resources to conduct experiments in Peru, and also socio-political reasons like the terrorism of the 1980s which destroyed research stations, killed genetically improved herds and stopped further research on South American Camelids (SAC) in the Andes. Also, the priority for the government was to develop other breeding livestock like cattle and sheep, due to a poor understanding of the real importance of SAC breeding for more than 500,000 families who live in the Andes under conditions of extreme poverty.

Endocrinology in alpacas and llamas is poorly understood and there is a need to conduct basic experiments on hormonal profiles in prepubertal, pubertal and adult animals, to elucidate if the endocrine mechanism follows the patterns described in other domestic species.

Early studies in female reproductive physiology were conducted in the late 1960s and early 1970s in the areas of puberty, mating stimuli and ovulation, ovarian stimulation and *corpus luteum* function by Fernandez-Baca, Novoa and San Martin from San Marcos National University (UNMSM) in Peru. In the middle of the 1970s some research was conducted on ovarian dynamics using laparoscopy, and later on transrectal ultrasound as a non-invasive technique. Other studies were also conducted in the area of sperm collection, evaluation and artificial insemination.

In the 1990s, some research was conducted on alpacas and llamas measuring hormones like oestradiol and progesterone during pregnancy, and luteinising hormone (LH) release during the copula stimuli. In the late 1990s, research was focused on superovulatory treatments and control of ovarian follicular waves (for some reason more in llamas than alpacas).

Recently a study on follicular waves in alpacas has been carried out in Australia by Vaughan *et al.* (2002) which confirms the occurrence of follicular waves in alpacas as postulated by Bravo *et al.* (1976). The later study points to the need for further research into efficiently controlling follicular waves in order to obtain better fertility rates upon natural mating, artificial insemination and also in embryo transfer protocols.

There are still important areas of research to be done on female reproductive physiology in alpacas. This paper reviews the knowledge up to now on alpaca female reproductive physiology in the areas of puberty, follicular waves, sexual receptivity and mating behaviour, ovulation, and pregnancy. It also describes briefly the current knowledge on the control of ovarian activity with hormonal treatments. Additionally, the paper discusses the need for research in the future to generate useful information that will improve fertility via the application of reproductive biotechnologies in alpacas.

Puberty

The age of onset of puberty in alpacas remains undetermined. It has been reported that puberty occurs between 10 and 24 months of age (Novoa M 1981; Sumar 1985; Bravo and Sumar 1989; Fernandez-Baca 1993; Pollard *et al.* 1995). There is evidence in alpacas, as in other domestic species, that puberty is associated with body weight. It has been established in the past that when the female reaches 40 kg she is ready for the first mating. (Novoa, Fernandez Baca *et al.* 1972).

A relationship has been found between live weight, mating and subsequent birth rates. For each kilogram increase in live weight up to 33 kg there was a 5% increase in birth rates. In the case of animals weighing more than 33 kg this relationship was not found (Leyva *et al.* 1981). This is directly related to nutrition, with better nutritional status leading to faster growth rates (Elwishy 1988; Smith, Peter *et al.* 1994).

Under conditions prevailing in the Andes, alpacas are bred at 2 years of age when they reach 40 kg, although pregnant females have been observed at 6 months of age. This is indicative of ovarian functionality but is not recommended, as it will affect future growth of the female and could cause dystocia (Aba 1995). Regrettably there are no studies available on endocrinological changes during prepubertal to pubertal periods in alpacas. It has been reported in SAC that the time at which follicles acquire the ability to synthesise oestrogen may be as early as 5-6 months of age, by measuring the urine oestrone (Bravo *et al.* 1991). Using transrectal ultrasonography, no difference in terms of ovarian follicle populations has been found in females from 11 to 18 months of age in comparison with 3 year old adult females (Bravo and Sumar 1989).

Ovarian follicular wave characteristics:

All camelids are considered induced ovulators which means that the copula stimuli are necessary to activate the GnRH release and then the LH surge occurs and ovulation occurs (Sumar 1996). As in camels (Skidmore 2004) and llamas (Adams, Griffin *et al.* 1989), follicular growth occurs in waves in alpacas (Bravo and Sumar 1989; Vaughan, Macmillan *et al.* 2004).

A new wave emergence in alpacas is characterised by the appearance of 8 to 10 follicles *(Figure 1)* (<3 mm) followed by continued growth of usually one follicle. This follicle will become dominant later on and the rest of the subordinate follicles will regress (Vaughan, Macmillan *et al.* 2004).

This is a hormonal mechanism in which two hormones are responsible for the regression of the subordinate follicles: oestradiol and inhibin, as described before in the cow and ewe (Reyna 2005). At present there are no studies which have been conducted on alpacas studying follicular dominance by measuring these hormones.

As induced ovulators, female alpacas undergo repeated follicular waves with growth and regression of dominant and subordinate follicles and with lack of ovulation in both breeding and non-breeding seasons, in the absence of the mating stimuli. If the appropriate mating stimuli is present, the formation of a *corpus luteum* (CL) will occur (Bravo 1993).

It has been reported that 3-4% of female alpacas are able to spontaneously ovulate, and this phenomenon has been associated with the presence of the male, as with the 'ram effect' observed in the ewe.

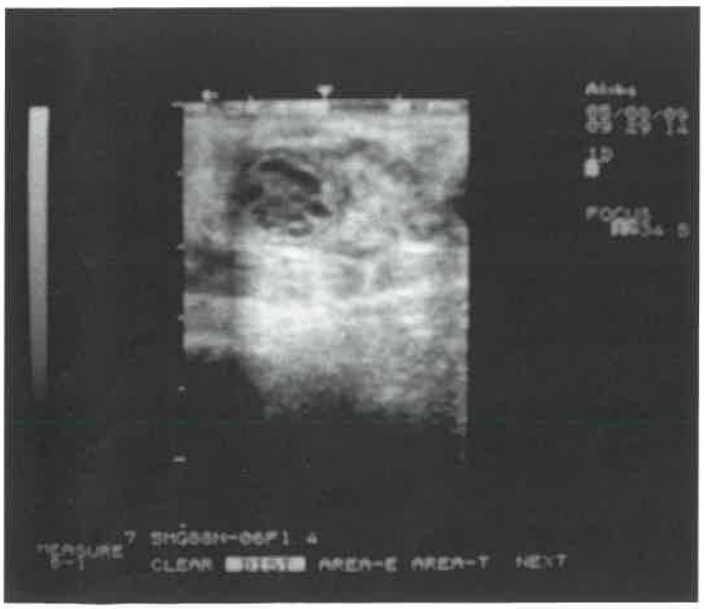


Figure 1: Ultrasound image of an alpaca ovary. Follicles appear as black circular structures surrounded by echogenic ovarian tissue, due to fluid absorbing rather than reflecting ultrasound waves.

The period of time between follicular waves is called the inter-wave interval. This has been reported in alpacas to be 11-12 days, measured by laparoscopic examinations (Bravo and Sumar 1989), and 12-16 days in 71% and 18-22 days in 29% of the females respectively, measured by transrectal ultrasonography (Vaughan *et al.* 2004). The growth period of the follicles in alpacas has been estimated to be 3-5 days, the static period to be 4 days and the regression period to be 4 days as well, in the case of follicular waves of 12 days length (Bravo and Sumar 1989). Emergence of the next successive dominant follicle occurred in the ipsilateral ovary in 60%, and in the contralateral ovary in 40%, of cases (Vaughan, Macmillan *et al.* 2004). The growth rate of ovarian follicles reported between days 0 and 10 was 0.43 ± 0.02 mm/day.

In the case of llamas, the same effect of the dominant follicle suppressing the growth of the subordinate follicles has been described. The inter-wave interval reported in this case was 11 days (8 to 14) corresponding to 5 days of growth, 5 days of stasis and 4 days of regression, respectively. The development of the subsequent dominant follicle usually began within 2-3 days after the onset of regression of the dominant follicle. This development tended to alternate between ovaries, as described in alpacas (Bravo, Fowler *et al.* 1990).

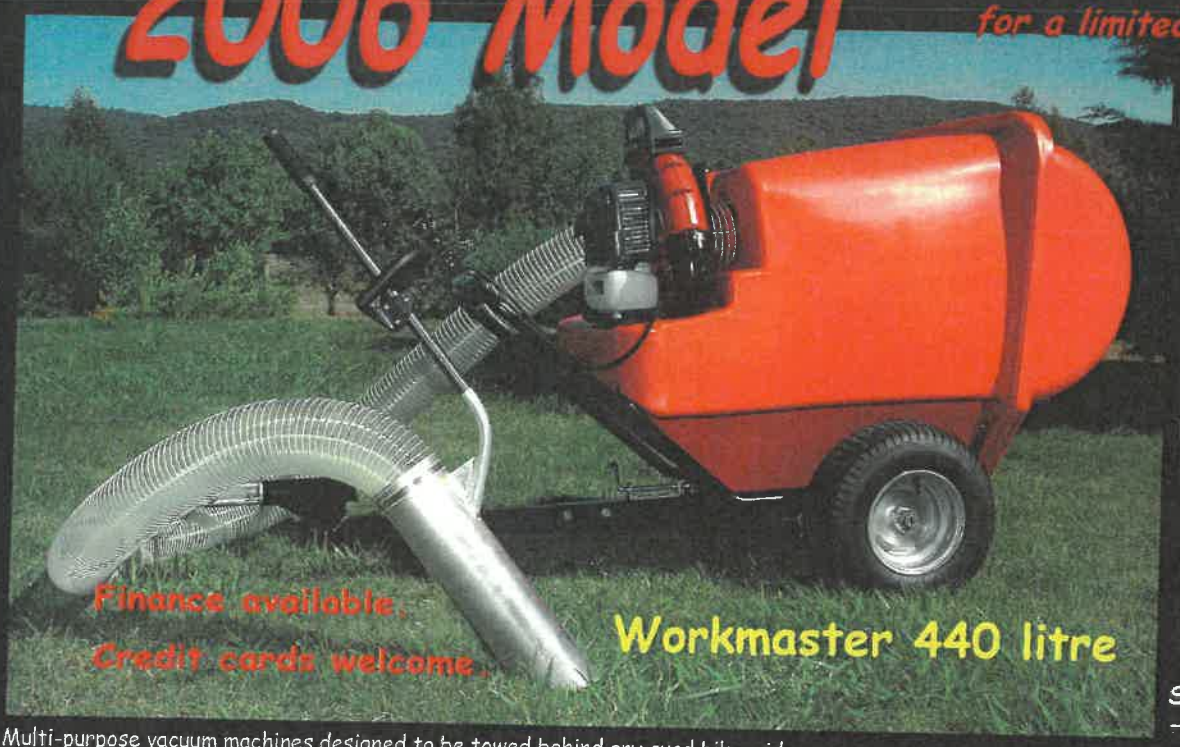
Taking into account follicular waves' intervals, it is possible to postulate that there may be an optimum time for mating which can be defined as the time when the dominant follicle reaches a mature stage and the oocyte is capable of being fertilised. In this regard, it has been postulated that this time could be between days 6 to 8 after a wave emergence, based on follicle diameter (Vaughan, Macmillan *et al.* 2004). A field trial which considers oocyte quality along the follicular wave, to confirm if this optimum time can be predicted with more accuracy, would be interesting. This is a crucial area of research because many of the poor responses to AI may be related to different oocyte stages like the immature or regression stages which, even with the capacity to be fertilised, could have low viability upon fertilisation.

A protocol for inducing follicular waves in alpacas needs to be developed, perhaps testing progesterone/progestagens and thereby determining the possibility of synchronising a new follicular wave and predicting the stage of development of the ovulatory follicle, in order to induce ovulation. This may guarantee better fertility rates using AI, and may give a better yield of embryos in ET programs.

In summary, follicular waves occur in alpacas as in other domestic species like cows and ewes, the main difference being that ovulation takes place after the mating stimuli. In other words, if there is no mating there is no luteal phase in the cycle, with the exception of some spontaneous ovulations. ➤

2006 Model at last year's prices!

for a limited time only



Great new features

Wide wheel pack with "turf tyres" to protect your pastures

Safety swivel tow hitch - for balance & stability

Multi-purpose vacuum machines designed to be towed behind any quad bike, ride on mower or compact tractor.

Engineered & developed to international standards. The gutsey Kawasaki 3.1 HP motor, combined with the large stainless steel filtration system, effectively produces the most powerful airflow & suction system. It will pick up from long grass, in the wet or dry. Flexible, lightweight hose & handle & easy tilt system makes it easy use & empty. Tough, non-corroding bin & sturdy frame.

Great package Deals

Combine any paddock cleaner from our range with our 4 sroke 250cc Qtrax Quad Bike & make a great saving on a fantastic combination.

NSW Agent - Redgum Saddlery
02 4272 2298

New Zealand Agent - D.K.Putt Ltd
09 262 38200

For a demonstration call Richard on

03 5776 4344

The Paddock Cleaner Range

Grace Park Developments Pty Ltd ABN 56 088 407 041
email graceparkdev@optusnet.com.au

Sexual receptivity and mating behaviour

In camelids, oestrus is not a cyclic, repeatable and predictable behaviour. In the case of alpacas there is a large individual variability in signs and length of oestrus (Sumar K 1993). The variability of oestrus length could presumably reflect the fact that in non-mated females the follicular phase does not end with ovulation and there is no luteal phase (Bravo, Fowler *et al.* 1990).

It is possible to find females with different stages of development of the dominant follicle, and thus oestradiol concentrations may be variable, producing heterogenous oestrous behaviour in the herd. As was mentioned before, ovarian follicular waves in alpacas overlap, ensuring the adequate production of oestradiol from the dominant follicle at all times.

Receptivity is usually maintained, but females exhibit brief periods of non-receptivity when no mature follicles are present (San Martin, Copaira *et al.* 1968; Bravo and Sumar 1989). It is important to mention that receptivity is not a guarantee of a well developed follicle able to ovulate and continue with fertilisation.

Few or none of the external signs of oestrus in the other domestic species are present in alpacas. Receptive females have a typical behaviour in the presence of the male. When a female is receptive and the male is in courtship mode she quickly sits down, assumes the posture known as sternal recumbency and exhibits passive behaviour. Some receptive females, when they are near a couple mating, sit down near them and frequently smell the male (Sumar K 1993).

If the female is non-receptive (mated females or with the presence of a *corpus luteum*) she will reject the male, spitting or threatening to spit, orientating and elevating her head towards the male, with ears held back, kicking and vocalising or emitting a loud, high-pitched squeal and attempting to escape (Pollard, Littlejohn *et al.* 1995).

It has been reported in Peru during the breeding season (December to March) that females sometimes mate other females, as observed in cows (Huanca 1993). This phenomenon coincides with apparently better follicular development and oestradiol production during this time of the year (Bravo and Sumar 1989).

When a male chases a receptive female, he will press his legs onto her back trying to force her to adopt the sternal recumbency position *(Figure 2)*. Copula takes 20 minutes average (5 to 50 minutes). In some cases when copulation is prolonged, the female lies on her side while the male is mating. It has been observed as well that the female raises her neck and faces the male, and it has been postulated that this coincides with the passing of the penis through the cervix and the intra-uterine deposit of sperm.

Figure 2: A male chasing a receptive female getting ready to adopt sternal recumbency.

Time taken to adopt sternal recumbency is not a reliable indicator of either plasma oestradiol concentration or maximum ovarian follicle diameter. Females can adopt the copula position with follicles ranging from <3 to <13 mm and plasma oestradiol concentration from 0.32 to 9.96 pg/mL (Vaughan, Macmillan *et al.* 2003). In contrast, other authors reported a relationship between ovarian follicular growth and behavioural receptivity in alpacas and llamas (Bravo and Sumar 1989; Adams, Sumar *et al.* 1990). On the other hand, sitting has been considered to indicate that the female is receptive to the male, but is also exhibited by alpacas under stressful conditions (Fowler 1989). Sitting to allow mating could be confused with sitting in response to the stress of being chased by a male (Pollard, Littlejohn *et al.* 1994). The variability in sexual behaviour of female alpacas has been attributed to environmental differences, degree of domestication and social structure of the herd (Novoa M 1981).

The effect of season on sexual receptivity in alpacas has been reported to influence, but not limit, the sexual activity of the females. Studies conducted in Peru reported an increase in sexual receptivity from December to March, corresponding to the rainy season (Huanca 1993). Follicular activity examined by laparoscopy tended to be slightly lower during the non-breeding season (August to September) (Bravo and Sumar 1989). Under New Zealand conditions, it has been reported that females were less receptive in spring than in autumn (Pollard, Littlejohn *et al.* 1995).

In summary, the reproductive status of the female can be related to her behaviour in the presence of the male, particularly spitting and attempting to escape from the male. This behaviour may indicate that ovulation has taken place and the presence of a corpus luteum secreting progesterone. A sitting position might not necessarily indicate receptivity: as we mentioned before, it might be a sign of stress. ➤

Ovulation

Induced ovulators

Alpacas and the other camelids belong to the group of animals called 'induced ovulators' (Sumar K 1993). This means that the female does not ovulate until she has been mated by the male. The mating stimulates the release of the LH surge within 15 minutes after copulation, and ovulation will occur 30 hours later in llamas (Bravo, Fowler *et al.* 1990).

One of the first studies conducted in Peru showed that the type of stimulus modulates the response of the females. The percentage of females which ovulated upon mating with a male which had a device to prevent penis intromission, or upon mating by another female, was low.

On the other hand, stimulation by a male without penile intromission and subsequent artificial insemination resulted in a significant increase in ovulation, in up to around 33% of the females tested. These results were explained by the stimulus of the vagina during artificial insemination.

Copulation with a vasectomised male increased the percentage of females ovulating (77%). These results were explained by the stimulus of the vagina during artificial insemination. Interrupted copula had no effect on the percentage of females ovulating, which means there is no relationship between copulation length and ovulation. Multiple copulation also had no effect on ovulation (Fernandez Baca, Madden *et al.* 1970).

On the other hand, is has been reported that alpacas and llamas may ovulate spontaneously when they are isolated from males and are in contact with males for a few minutes for oestrus detection. These ovulations have been attributed to the presence of the male ('the male effect') which involves pheromones (Leyva V and Sumar K 1987; Adams, Sumar *et al.* 1990).

In summary, alpacas are induced ovulators as they need the copula stimulus to release the LH surge and then to ovulate. On the other hand, they are capable of ovulating spontaneously as a response to the 'male effect'. The nature of induced ovulation makes the application of artificial breeding techniques like artificial insemination difficult if it is not possible to predict the time of ovulation with accuracy, especially when frozen-thawed sperm is used, due to its short lifespan in the uterus.

Ovulation induction factor

The presence of an 'ovulation induction factor' has been described in alpacas by injecting 0.8 to 1.0 ml of seminal plasma into female alpacas, where upon ovulation was achieved in 60% of cases (Sapana, Huanca *et al.* 2002).

Studies conducted *in vitro* demonstrated that the seminal plasma of adult alpacas can induce rat hypophyseal gonadotrophic cells to secrete LH, but dilution (1:2 and 1:4) did not significantly increase LH secretion. Also, the addition of anti-GnRH antibodies did not modify the response of the cells to the stimulus of seminal plasma. This suggested that the stimulating effect could be mediated by factor(s) chemically different from GnRH (Paolicchi, Urquieta *et al.* 1999).

In Bactrian camels, a species phylogenetically related to SAC, the presence in the seminal plasma of a factor expressing GnRH-like biological activity which can stimulate the secretion of LH has been described (Xilong and Zhao 2002). Intramuscular injections with seminal plasma induce ovulation in camels via increase of LH and follicular stimulate hormone (FSH) in a similar manner to when ovulation is produced by natural mating (Paolicchi *et al.* 1999).

In summary, seminal plasma contains an ovulatory factor that improves the chances of the female ovulating when copula occurs, and could be an adaptive mechanism to the harsh conditions in the Andes to ensure ovulation, and thus fertilisation and pregnancy.

Follicle diameter and response to copulation

As was mentioned before, receptivity is not indicative of the presence of a mature follicle ready to ovulate, fertilise and continue with embryonic development. It has been described in both llamas and alpacas that the ovulatory release of LH depends on ovarian follicular diameter. Females with small follicles (4-5 mm) released less LH and did not ovulate, in comparison with animals which presented growing, mature or regressing follicles. This finding could be explained by the reduced gonadotrophin-related oestrogen priming of the hypothalamus and pituitary. On the other hand, copulation of females with regressing follicles provoked release of LH similar to that observed in animals with growing or mature follicles, but luteinisation took place instead of ovulation. This fact could indicate that regressing follicles have lost the capability to secrete factors like enzymes which are necessary for the rupture of the follicle (Bravo, Stabenfeldt *et al.* 1991).

The application of this knowledge is very important when reproductive technologies like artificial insemination and embryo transfer are involved. If the ovulation-induced female has small or regressing follicles, she may not be able to ovulate and to form an appropriate *corpus luteum.* This may cause low fertility rates upon application of reproductive techniques. Synchronising follicular waves to establish follicular status is necessary to ensure better fertility rates.

Time of ovulation

The female alpaca ovulates 24 hours after copulation (San Martin, Copaira *et al.* 1968; Fernandez Baca, Madden *et al.* 1970), although different intervals have been reported in the past – from 24 to 72 hours (Sumar 1985; Sumar K, Bravo *et al.* 1993).

The size of the ovulatory follicle has been reported to be between 6-8 mm *(Figure 3 and Figure 4)*. In the case of llamas, an interval from 24 to 96 hours has been reported (Adams, Griffin *et al.* 1989; Adams, Sumar *et al.* 1990; Bravo, Fowler *et al.* 1990; Sumar K 1993; Aba, Forsberg *et al.* 1995; Bourke, Kyle *et al.* 1995; Ratto, Huanca *et al.* 2005).

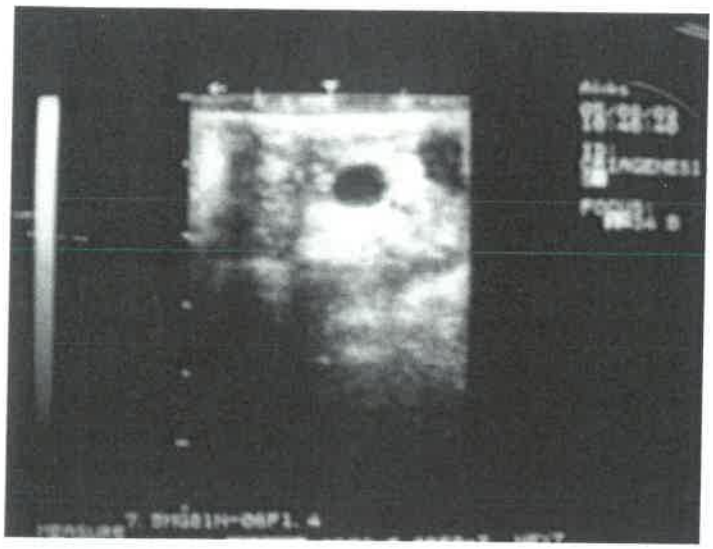


Figure 3: Ovulatory follicle in alpaca around 6 mm, captured by transrectal ultrasound.

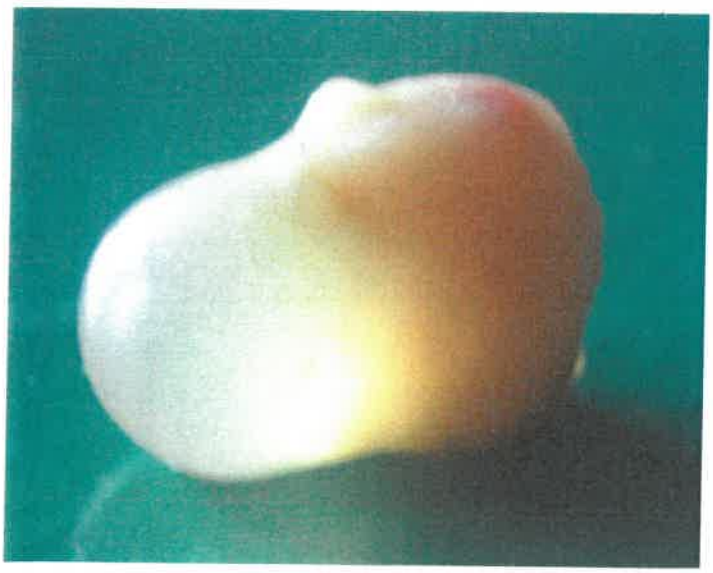


Figure 4: Ovulatory follicle in an adult 23 year old alpaca around 9 mm. the follicle contains fluid rich in oestradiol.

There are many factors which have been described in other species like sheep and cattle which may affect the time of ovulation. The factors which have been found to modify this interval are: season, age, breed, nutrition, lactation, ram exposure, the kind of progestagen and the dose of exogenous gonadotrophin used in oestrus synchronisation protocols (Colas 1979; Robinson 1979; Romano 1996), and differences between flocks (Walker *et al.* 1988). These factors affect the efficacy of both fixed time artificial insemination and embryo transfer programs (Walker *et al.* 1989; Romano *et al.* 1998).

Regrettably, in the case of SAC there are no studies that evaluated the effect of these variables on the time of ovulation. Research has been limited to GnRH and hCG analogue applications which we will discuss later on in this review. It will be extremely important to conduct a study on alpacas to determine whether these factors are significant, because they could provide alternatives which improve fertility upon application of artificial breeding techniques.

Ova transport

Transport of ova from the oviducts to the uterus in alpacas is similar to that reported in other species (6-7 days) like ewes (Rowson and Moor, 1966); cows (Rowson *et al.* 1969); pigs (Hunter 1974); and mares (Oguri and Tsutsumi 1972).

Development of embryos in alpacas after fertilisation also appears to be similar to that observed in other livestock species. Four days after copulation it is possible to collect embryos from the oviducts which are at the morulae stage with 4-8 blastomeres.

By day 7, embryos collected from the left oviduct were compact morulae and it was not possible to count the number of cells *(Figure 5)*.

By day 10, embryos were collected from the left uterine horn as blastocysts (Bravo, Moscoso *et al.* 1996). This knowledge is very important in ET programs in order to flush the females at the right time. ➤

Figure 5: Alpaca hatched blastocyst flushed from a donor at day 7 under stereoscopy. Embryos are visible to the eye and look like white-milky spheric structures.

7.64Kg

JOLIMONT ALESSIO

2004 Histogram: 24.2u, 4.1sd, 16.9cv, 93.5 cf, 22.8sf

Mobile Service Available VIC, NSW, SA. Service Fee $880

Coricancha Alpaca Stud. Benoît 0419 420 110

www.infoalpaca.com

Corpus Luteum function

The *corpus luteum* originated by natural mating or HCG application in the alpaca attains a maximum diameter at day 8-9 in the absence of pregnancy *(Figure 6)*.

Figure 6: Ultrasonographic image of two corpus luteum in a superovulated alpaca. The structures had a hyperechogenic shape, similar to the ovarian parenchyma but slightly less even. On the left, a 5 mm follicle.

Morphological regression changes are measurable as early as day 12, but secretory changes are more dramatic than morphological changes. A sharp decline in progesterone secretion by the *corpus luteum* is observed at day 13 and complete regression at day 15.

This indicates a short lifespan of the *corpus luteum* in alpacas in comparison with other domestic species. Factors involved in this early regression are unknown. A possible explanation for it could be that the mechanism controlling luteal maintenance and regression in alpacas differs from those in other species.

In the case of pregnant females, after day 8 post copula no significant differences in *corpus luteum* size and progesterone levels have been found, with the exception of a transient decline in weight and progesterone production on day 13. This may suggest that once the maximum development is reached, the embryo prolongs the functional life of the *corpus luteum* without marked increase in size, total mass or secretory profile. The transient decline may suggest that this stage represents the critical period of zygote survival (Fernandez Baca, Hansel *et al.* 1970).

Additionally, it was reported that *corpus luteum* located in the right ovary regress more rapidly than those in the left ovary. This suggests that this differential regression may influence embryo survival and may explain the rate of migration of embryos from the right to the left uterine horns in alpacas (Fernandez Baca, Sumar *et al.* 1973).

This regression is under the influence of the uterus, as partial hysterectomy extends the lifespan and secretory activity of the *corpus luteum* ipsilateral to the missing horn (Fernandez-Baca, Hansel *et al.* 1979).

There seems to be a different luteolytic effect of the right and left uterine horn in alpacas. In females with a *corpus luteum* on the left ovary, absence of the ipsilateral uterine horn extends the luteal function, evidenced by high progesterone levels, large *corpus luteum* size and lack of sexual receptivity for a period of up to 70 days. Contrarily, removal of the right uterine horn in females with a functional *corpus luteum* on the right ovary causes a slight delay in luteal regression.

In females with a *corpus luteum* on each ovary, removal of the left uterine horn results in regression of the *corpus luteum* on the right ovary and persistence of the *corpus luteum* on the left ovary. Removal of the right uterine horn results in regression of the *corpus luteum* in both ovaries.

This finding indicates that the luteolytic effect of the left uterine horn is local and systemic while the luteolytic effect of the right uterine horn is local. This may explain why *corpus luteum* located on the right ovary regress more rapidly than those located on the left ovary (Fernandez-Baca *et al.* 1979).

In summary, *corpus luteum* lifespan in alpacas is shorter than in other domestic species, and the regression is under the influence of the uterus. Additionally, there is a differential luteolytic effect of the right and left uterine horns, being local for the right and local and systemic for the left. The reason for this difference is unknown.

Pregnancy

Length of gestation in alpacas of the Suri and Huacaya breeds has been reported to be 345 and 341 days, respectively. In almost all cases, alpacas' foetuses occupy the left uterine horn, even when ovulation takes place from both ovaries without statistical differences. This indicates that embryos originating from the right side migrate to the left side.

The reason for this is unknown, but it could possibly be explained by the differential luteolytic effect of the right and left uterine horn discussed above. The *corpus luteum* is necessary to maintain pregnancy in alpacas during the whole gestational period (Sumar 1985). ➤

Parturition

Labour under conditions prevailing in the Andes in Peru higher than 4,000 m above sea level lasted 200 and 190 minutes for primiparous and multiparous females, respectively.

More than 90% of births occur between 07:00 and 13:00 hours and this has been considered an adaptive mechanism that gives the newborn a chance to get warm and dry before the cold of the night.

Puerperium

Up to the fourth day after parturition the female alpaca is submissive and will be receptive to being mounted by the male. However, luteal regression, follicular growth and uterine involution are not complete and the female will not become pregnant from such early matings. Mating of alpaca females is recommended within 15 to 20 days after giving birth to obtain good fertility rates and one cria per year.

Control of the ovarian activity with hormonal treatments

For some reason, most of the research conducted in this area has been limited to llamas. This information needs to be used carefully as, although llamas and alpacas belong to the same family *(Camelidae)*, it has been found that the llama descends from the guanaco and the alpaca from the vicuña.

We may expect to find similarities in reproductive endocrinology, but further studies need to be conducted to confirm if both species present the same endocrine patterns.

Induction of ovulation

The importance of a reliable technique to induce ovulation in alpacas is critical for successful development of fixed-time insemination protocols and for recipient synchronisation in embryo transfer protocols.

Moreover, considering the peculiar characteristics of alpaca sperm, which is low in concentration and motility and difficult to freeze without considerable damage, induction of ovulation is a key part of the process to synchronise the deposit of the sperm in the female reproductive tract with ovulation.

This provides the opportunity to use low sperm concentration per female inseminated and the possibility of maximising the use of an ejaculate from a particularly valuable male.

One of the first successful experiments inducing ovulation in alpacas was with the use of 750 IU of hCG. The time of ovulation reported after the application was 24 hours, however the method of detection was necropsy and this limited characterisation of the mean interval and distribution of ovulations (San Martin, Copaira *et al.* 1968).

Later the same dose of hCG was used successfully to induce ovulation in females for artificial insemination (Bravo, Flores *et al.* 1996).

In llamas, a study using transrectal ultrasound to follow up ovulation reported an interval of 27 and 28 hours after 750 IU of hCG and 8 ug of GnRH analogue treatment, respectively (Adam, Bourke *et al.* 1992).

Gonadotrophin hormones (Sumar 1985; Ratto, Singh *et al.* 2003) and GnRh analogues (Bourke, Kyle *et al.* 1995; Correa, Ratto *et al.* 1997; Bourke, Kyle *et al.* 2000; Aller, Rebuffi *et al.* 2002) have been used to induce ovulation in receptor llamas for embryo transfer programs. The time of ovulation varied from 24 to 36 hours, according to dose and probably different environmental conditions like photoperiod, body condition, presence of mature follicles etc.

A comparative study on the time of ovulation has been conducted recently in llamas upon natural mating and upon the application of 5 mg of LH or 50ug of GnRH. Time of ovulation was 30, 29 and 29 hours after natural mating, LH and GnRH application, respectively (Ratto, Huanca *et al.* 2005). A similar study on alpacas is necessary under Australian conditions to determine whether there are significant differences, also taking into account season, body condition, age and presence of the male.

In summary, treatments with both hCG and GnRH have been shown to be effective in inducing ovulation in alpacas, although further studies to elucidate the influence of other variables on the time of ovulation like season, nutrition and body condition, presence of the male etc. would be desirable.

Ovarian follicular wave synchronisation

Establishing a protocol to control follicular waves in alpacas will dramatically improve breeding management, reducing the time taken for detecting sexual receptivity, and will possibly increase fertility rates upon artificial insemination and increase the yield of embryos in superovulation programs. This protocol needs to ensure the presence of a healthy mature ovulatory follicle able to ovulate and be fertilised for AI, and probably the absence of a dominant follicle for superovulatory treatments.

A follicular wave in alpacas lasts 11-12 days and can last up to 22 days (Vaughan, Macmillan *et al.* 2004). This extended lifespan of the follicle causes atresia, which can be defined as a combination of biochemical, physiological and histological processes in the follicle leading to degenerative changes and loss of integrity/viability. These changes are associated with altered passage of nutritive substances from the plasma in the follicle and loss of receptors for various hormones (Scaramuzzi *et al.* 1993). Ovulatory follicles with a degree of atresia could be a cause of low fertility at natural mating or upon application of reproductive technologies like artificial insemination.

There is no information in alpacas regarding how atresia affects the competence of the oocyte to be fertilised, and studies in this area could provide the key to this matter. Interesting techniques to study in this area could be ovum pick-up at different days during the follicular wave, as well as histological studies and *in vitro* fertilisation experiments.

In cattle, ovarian follicular wave synchronisation has been reported using hormonal treatments like GnRH, LH and oestradiol in combination with progestagens. The principle is removing the suppressive effects of the dominant follicle, either inducing its ovulation (GnRH, LH) or atresia (Oestradiol). After that a new follicular wave starts, followed by the development of a dominant follicle capable of ovulating at a predictable time.

In the case of llamas, progestagens have been used extensively to synchronise follicular development, with variable results (Aller and Alberio 1996; Aller, Ferre *et al.* 1997; Aba, Quiroga *et al.* 1999; Ferrer, Aguero *et al.* 2002; Ratto, Singh *et al.* 2003). The rational use of progestagens alone to synchronise follicular waves is unclear, as luteal phases are not characteristic of the reproductive cycle of induced ovulators (Adams *et al.* 1990). Treatments in llamas with Oestradiol + progesterone, LH, or Oestradiol + progesterone + LH, achieved the same ovulation rates as animals naturally mated, but the pregnancy rate was higher in treated animals (Ratto, Singh *et al.* 2003). Another study, using 0.33 g of progesterone (CIRD®) inserted for 16 days in llamas, reported an inhibition of the ovarian follicular activity regardless of the stage of follicular development at the time of insertion. In addition this study reported the lowest ovarian activity between days 5 and 7. This time could be appropriate to start a superovulation protocol, as there is then no dominant follicle and the new cohort of follicles that will emerge will have more chance of being viable (Chavez, Aba *et al.* 2002).

Using sponges containing 120 mg of medroxyprogesterone acetate (MAP) for a period of 9 days, and the application of GnRH at day 6 after removal, has been shown to be effective as a method of synchronising ovarian follicular waves in llamas (Aba, Quiroga *et al.* 1999). Nevertheless, this study monitored corpus luteum lifespan and progesterone concentrations only and not fertility after the treatment.

Norgestomet implants (6 mg) for 14 days (winter) and 9 days (summer) + an injection (3 mg of Norgestomet + 5 mg of oestradiol valerate) at implant insertion + a dose of GnRH at implant removal, produced ovulations in 78% of llamas in both seasons (Aller, Ferre *et al.* 1997). ➤

Contrarily, another experiment using the same protocol produced the same percentage of females ovulating in comparison with natural mating (Aller, Ferre *et al.* 1997). The reason may be that the first report did not use a control group to make a comparison.

Injection of 50 mg/day of progesterone for 13 days efficiently synchronised a new follicular wave in llamas. Seven days after the last injection, all the females had follicles (>6 mm) susceptible to ovulation. After natural mating 85% of the females ovulated and presented a *corpus luteum* (Aller and Alberio 1996). No fertility rates were reported in this experiment.

In alpacas, a single injection of 1 mg of oestradiol alone, or combined with 100 mg of progesterone or 2-5 mg of oestradiol, did not induce a new follicular wave. Contrarily, treatments with 10 or 100 mg of progesterone at 12 hour intervals over a period of 4 days, 25 mg of progesterone twice daily for 21 days or 25 mg of progesterone twice daily for 9 days + 2 mg of oestradiol, were effective in inducing a new follicular wave. The most practical protocol was the injection of 200 mg of progesterone on days 0, 2 and 4 of the cycle. Oocytes from females treated with progesterone were retrieved using ultrasound-guided transvaginal aspiration and it was concluded that morphology and capacity to respond to LH application was not affected by progesterone treatment. Field trials confirmed that the quality of the oocytes was not affected by progesterone treatment, but pregnancy rates were no different than in placebo-treated animals (Vaughan 2002).

In summary, several hormones have been tested with a view to synchronising follicular waves, mostly in llamas and one test in alpacas. These hormones include the use of progesterone, progestagen, oestradiol, and combinations of progestagens and oestradiol, and have been shown to be effective in inducing a new follicular wave, but no significant differences have been reported in comparison with untreated females. A comparative study that considers all these different hormone applications needs to be done using a large group of alpacas, to draw a conclusion.

An interesting approach to the use of synchronisation protocols could be in trying to control the presence of a dominant follicle prior to a superovulatory treatment. An improvement of the yield of embryos in cows and ewes when there is no dominant follicle present at the ovary during the superovulatory treatment has been reported.

This finding has been explained by the fact that the dominant follicle produces oestradiol and inhibin, which affect the growth of the subordinate follicle. In the absence of a dominant follicle, follicles at the ovary have a better chance of responding to the superovulatory treatment.

The future

Female reproductive physiology in alpacas is still not well understood and further research needs to be conducted in several areas. Time of ovulation under different hormonal protocols in different seasons and locations needs to be studied to elucidate if these variables affect ovulation and to find the best way to synchronise the deposit of the sperm in the uterus with ovulation. Another important area of study is how nutrition and body condition may affect follicular waves, and to find if there is a relationship with embryo loss.

There is a need to develop a technique to predict when a mature follicle able to ovulate and facilitate fertilisation is present on the ovary. Follicular wave synchronisation with the use of progesterone/progestagens needs to be reviewed carefully, and probably a field trial with a large group of animals should be performed to validate its use. Finally, it is necessary to study the viability of oocytes at different developmental stages, perhaps with technologies like ovum pick-up. All this information generated will be useful for the application in these species of new reproductive techniques like artificial insemination, embryo transfer and in vitro production of embryos.

Acknowledgments

The author would like to thank Janie Hicks from Coolaroo Alpaca Stud and Dr. Jane Vaughan from Criagenesis for the opportunity to take photographs during a recent embryo transfer trial. Special thanks to Helen and Nestor Ellinopoullos from Orrapoora Alpacas for providing the alpaca reproductive tract. Special thanks to Mr. Peter Krockerberger for editorial assistance.

Correspondence to be addressed to Jorge Reyna.
Alpaca Reproductive Technologies (ART),
7/520 New Canterbury Road, Dulwich Hill NSW 2203
AUSTRALIA.

References

- Aba, M. A. (1995). *"Studies on the reproductive endocrinology of llamas and alpacas."* Faculty of Veterinary medicine. Uppsala -Sweden, Swedish University of Agricultural Sciences.
- Aba, M. A., M. Forsberg, et al. (1995). *"Endocrine changes after mating in pregnant and non-pregnant llamas and alpacas."* Acta Veterinaria Scandinavica 36(4): 489-498.
- Aba, M. A., M. Quiroga, et al. (1999). *"Control of ovarian activity in llamas (Lama glama) with medroxiprogesterone acetate."* Reproduction in Domestic Animals 34: 471-476.
- Adam, C. L., D. Bourke, et al. (1992). *"Ovulation and embryonic recovery in the llama."* 1st International camel conference.
- Adams, G. P., P. G. Griffin, et al. (1989). *"In situ morphologic dynamics of ovaries, uterus and cervix in llamas."* Biology of Reproduction 41: 551-558.
- Adams, G. P., J. Sumar, et al. (1990). *"Effects of lactational and reproductive status on ovarian follicular waves in llamas (Lama glama)."* Journal of Reproduction and Fertility 90(90): 535-545.
- Aller, J. F. and R. Alberio (1996). *"Dinamica folicular ovarica en llamas y su control con progesterona exogena."* Revista Argentina de Produccion Animal 16(Sup 1): 69-70.
- Aller, J. F., L. B. Ferre, et al. (1997). *"Synchronisation of follicular wave in llama (Lama glama) in two seasons (winter and summer)."* Revista Argentina de Produccion Animal 17(1): 243.
- Aller, J. F., L. B. Ferre, et al. (1997). *"Ciclo folicular natural vs ciclo sincronizado en llamas (Lama glama)."* Abra Pampa, INTA: 246.
- Aller, J. F., G. E. Rebuffi, et al. (2002). *"Successful transfer of vitrified llama (Lama glama) embryos."* Animal Reproduction Science 73: 121-127.
- Bourke, D., C. E. Kyle, et al. (2000). *"Recipient synchronisation and embryo transfer i south american camelids."* Theriogenology.
- Bourke, D. A., C. E. Kyle, et al. (1995). *"Superovulatory responses to eCG in llamas (Lama glama)."* Theriogenology 44: 255-268.
- Bravo, O. F. (2001). *"Estudio comparativo de tres metodos de colleccion de semen en alpacas."* Departamento de produccion animal. Lima, Universidad Nacional Agraria La Molina - UNALM.
- Bravo, P. W. (1993). *"Basic reproductive physiology in female South American camelids, zoo and wild animal medicine."* W.B. Saunders Company Philadelphia USA: 1993. 532-536. 28 ref.
- Bravo, P. W., U. Flores, et al. (1996). *"Collection of semen and artificial insemination of alpacas."* Theriogenology 47: 619-626.
- Bravo, P. W., M. Fowler, et al. (1990). *"Endocrine responses in the llama to copulation."* Theriogenology 33(4): 891-899.
- Bravo, P. W., M. Fowler, et al. (1990). *"Ovarian follicular dynamics in the llama."* Biology of Reproduction 43: 579-585.
- Bravo, P. W., J. Moscoso, et al. (1996). *"Transport of spermatozoa and ova in female alpaca."* Animal Reproduction Science 43(2/3): 173-179.
- Bravo, P. W., G. H. Stabenfeldt, et al. (1991). *"The effect of ovarian follicle size on pituitary and ovarian responses to copulation in domesticated South American camelids."* Biology of Reproduction 45(4): 553-559.
- Bravo, P. W. and J. Sumar (1989). *"Laparoscopic examination of the ovarian activity in alpacas."* Animal Reproduction Science 21(3-4): 271-281.
- Chavez, M. G., M. A. Aba, et al. (2002). *"Ovarian follicular wave pattern and the effect of exogenous progesterone on follicular activity in non-mated llamas."* Animal Reproduction Science 69: 37-46.
- Chipana, O. (1997). *"Colleccion de semen y evaluacion de dilutores sobre la viabilidad espermatica de alpacas."* Escuela de Post Gardo - Produccion Animal. Lima - Peru, Universidad Nacional Agraria La Molina - UNALM.
- Correa, J., M. Ratto, et al. (1997). *"Superovulation in llamas (lama glama) with pFSH and equine chorionic gonadotropin used individually or in combination."* Animal Reproduction Science 46: 289-296.
- Elwishy, A. B. (1988). *"Reproduction in the male dromedary (Camelus dromedarius): a review."* Animal Reproduction Science 17: 217-241.
- Fernandez-Baca, S. (1993). *"Manipulation of reproductive functions in male and female New World camelids."* Animal Reproduction Science 33(1-4): 307-323.
- Fernandez-Baca, S., W. Hansel, et al. (1979). *"Differential luteolytic effects of right and left uterine horns in the alpaca."* Biology of Reproduction 20(3): 586-595.
- Fernandez Baca, S., W. Hansel, et al. (1970). *"Corpus luteum function in the alpaca."* Biology of Reproduction 3(252-261).
- Fernandez Baca, S., D. H. L. Madden, et al. (1970). *"Effects of different mating stimuli on induction of ovulation in the alpacas."* Journal of Reproduction and Fertility 22(261-267).
- Fernandez Baca, S., J. Sumar, et al. (1973). *"Relationship between the location of the corpus luteum and that of the embryo in the alpaca. [Spanish]."* Revista de Investigaciones Pecuarias, Peru 2(2): 131-135.
- Ferrer, M. S., A. Aguero, et al. (2002). *"Sincrnizacion de la ond afolicular mediante el uso de buserelina en la llama (Lama glama)."* Investigaciones Veterinarias 4(1): 7-11.
- Huanca, T. (1993). Manual del alpaquero. Lima - Peru, INIA.
- Leyva V, V. and J. Sumar K (1987). Indicence of oestrus and spontaneous ovulation in Huacaya type alpacas. Utah.
- Lichtenwalner, A. B., G. L. Woods, et al. (1995). *"Seminal collection, seminal characteristics and pattern of ejaculation in llamas."* Theriogenology 46: 293-305.
- Novoa, C., S. Fernandez Baca, et al. (1972). *"Pubertad en la alpaca."* Revista de Investigaciones Pecuarias 1: 29-35.
- Novoa M, C. (1981). South American Camelidae. [Spanish], *"Recursos geneticos animales en America Latina. Ganado Criollo y especies de altura."* FAO. Rome Italy: 1981. 118-128.
- Paolicchi, F., B. Urquieta, et al. (1999). *"Biological activity of the seminal plasma of alapcas: stimulus for the production of LH by pituitary cells."* Animal Reproduction Science 54: 203-210.
- Pollard, J. C., R. P. Littlejohn, et al. (1995). *"Seasonal and other factors affecting the sexual behaviour of alpacas."* Animal Reproduction Science 37: 349-356.
- Pollard, J. C., R. P. Littlejohn, et al. (1994). *"The effects of mating on the sexual receptivity of female alpacas."* Animal Reproduction Science 34(3-4): 289-297.
- Ratto, M., W. Huanca, et al. (2005). *"Comparison of the effect of natural amting, LH and GnRH on interval to ovulation and luteal function in llamas."* Animal Reproduction Science In press.
- Ratto, M., J. Singh, et al. (2003). *"Ovarian follicular wave synchronization and pregnancy rate after fixed-time natural mating in llamas."* Theriogenology 60: 1645-1656.
- Reyna, J. (2005). *"Studies in time of ovulation in Merino ewes by transrectal ultrasound."* Veterinary science. Sydney, University of Sydney: 250.
- San Martin, M., M. Copaira, et al. (1968). *"Aspects of reproduction in the alpaca."* Journal of Reproduction and Fertility 16: 395-399.
- Sapana, R., T. Huanca, et al. (2002). *"Estudio del plasma seminal para inducir la ovulacion en alpacas."* Puno - Peru, INIA: 191-192.
- Skidmore, L. (2004). *"Reproductive physiology in the female camel."* www.ivis.org, Ithaca, New York, USA.
- Smith, C. L., A. T. Peter, et al. (1994). *"Reproduction in llamas and alpacas: a review."* Theriogenology 41(3): 573-592.
- Sumar, J. (1985). *"Reproductive physiology in South American camelids, Genetics of reproduction in sheep."* Butterworths London UK: 1985. 81-95. 44 ref.
- Sumar K, J. (1993). *"Efectos de los estimulos de induccion en la ovulacion de alpacas y llamas."* Investigaciones pecuarias 6(1): 1-6.
- Sumar K, J., P. W. Bravo, et al. (1993). *"Sexual receptivity and time of ovulation in alpacas."* Small Ruminant Research 11(2): 143-150.
- Vaughan, J. L. (2002). Improving the efficiency of reproduction and breeding in alpacas, RIRDC: 20.
- Vaughan, J. L., K. L. Macmillan, et al. (2003). *"Effects of mating behaviour and the ovarian follicular state of female alpacas on conception."* Australian Veterinary Journal 81(1/2): 86-90.
- Vaughan, J. L., K. L. Macmillan, et al. (2004). *"Ovarian follicular wave characteristics in alpacas."* Animal Reproduction Science 80: 353-361.
- Xilong, L. and X. X. Zhao (2002). *"Separation, purification and identification of ovulation-inducing factors in the seminal plasma of bactrin camel (Camelus bactrianus)."* Unpublished. ■

Carlotta: The Cagey, Cushing Camelid

EDUCATION ARTICLE by **Marty McGee Bennett** > CAMELIDynamics

Carlotta's reputation preceded her. Laurence Binder and his wife, Donna, from Texas, mentioned that they had an alpaca they couldn't wait for me to meet, and that they intended to "save her" for one of my clinics. According to both Binders, she was a miserable animal with which to deal, and absolutely would NOT lead, no matter what.

I asked Laurence to give me a bit of background on Carlotta. He told me: "Carlotta grew up in a big herd. She didn't receive a lot of individual handling and wasn't halter trained, but she was a normal, cooperative alpaca. When Carlotta was about 14 months old, she was noticed limping on her left front leg. She continued to limp after being stalled for rest, so she was taken for X-rays. The X-ray showed she had a ligament rupture in her knee as well as a chip fracture. Carlotta was scheduled for surgery to put a pin in her knee to repair the injury.

When Carlotta returned home, she had a cast on her left leg, and she was limited to stall rest for four weeks. The trauma of the surgery, the after care, and the isolation during the weeks after surgery had a huge impact on Carlotta's personality and behavior. When Carlotta came to Texas we knew from the minute we tried to get her out of the transporter's trailer, she would be our challenge.

After giving Carlotta several days to get accustomed to her new surroundings, we began trying to approach her when she was in the barn. It was obvious that having anything to do with us was very traumatic for her. She screamed and immediately cushed as we approached her. We tried to progress in little steps to help Carlotta understand that we were her friends, but we were never very pleased with the results.

After months of working with Carlotta, we were able to approach her without her screaming and cushing, but attempting to halter Carlotta was a huge mistake. She reverted back to her previous behaviors and again became, if anything, even more difficult. All of the routine care activities such as injections, trimming toenails, shearing, and breeding were all very stressful for Carlotta, and she always relied on cushing as her coping behavior. As a result, we ended up carrying her or dragging her any time we needed her in a specific place. Shearing was especially terrible! Finally, we decided to give up trying to teach Carlotta to lead, since it was obvious to us that she could never learn to do that."

Getting to the Classroom

I was setting up my book and video sales table early in the morning the first day of the clinic, when a flustered Laurence arrived and asked where he should offload Carlotta … "IF" he said, "I can get her out of the trailer! It took two of us to carry her into the trailer this morning and a shower afterwards!" I pointed at our set up under some trees by a beautiful little barn and suggested that Laurence park the trailer as close as he could to our classroom, then put her in one of the catch pens, and call if he needed me. With a look that said, "Of course I need help, that's why I brought the wretched beast with me," Laurence headed off gamely while I continued to set up. In a few minutes, Laurence was back saying, "Carlotta is out of the trailer but just barely and she is really stuck."

I first laid eyes on Carlotta's bottom, actually. It was perched high in the air with her front end folded up on the ground. Her head was plastered to the ground with her ears pinned so closely to her head that it looked like she didn't have any. She was screaming a little, but you could tell that she was holding back and could do better if pressed a bit more. Laurence, along with another couple, were doing their level best to move Carlotta, but she would have none of it. By pulling on the lead rope, they managed to get her to take a few tiny steps on her knees with her butt in the air and her head firmly on the ground. At this rate, with a hundred feet to go, it was going to be lunchtime before Carlotta made it to the classroom.

I have met "Carlotta" and her ilk time and time again, and while she may not be exactly like other alpacas that won't lead, other alpacas with similar difficulties have given some ideas about things that might work.

Animals that don't lead do know how to walk. They walk around the pasture all the time! The problem is walking on cue, in the desired direction, attached to a human. It has been my experience that in a pinch, herding these animals (rather than leading) is a lot easier on both the handler and the animal.

I asked a few helpers to station themselves so that they blocked any likely escape routes, leaving a clear and unobstructed path to the intended destination – the catch pen. Effective herding is nothing more than creating an escape route for the animal that suits you.

After having a look at her halter (more on this later) I took it off. Carlotta immediately got up and trotted right into the catch pen. I elected to totally remove her halter rather than merely unclipping the lead rope. Animals that have been dragged by the head associate this experience with the halter and often will not get up or try to move as long as they are wearing one even if there is no lead attached.

Take the halter off and it opens the animal's mind to the possibility of getting up and moving around.

Herding Instead of Leading

Perhaps the best handling advice I can offer for difficult animals is this: if what you are doing isn't working, do something different! Maybe as important, don't bother trying the same thing five or six times, if your idea doesn't work in one or two tries, "tweak" your technique by changing some aspect of it at least a little bit or switch to a different tactic altogether.

Getting Carlotta into the catch pen solved our immediate problem – it wasn't leading. It is a useful thing to remember, however, that herding animals that won't lead can be an option.

It is a whole lot easier, for instance, to load an alpaca that either won't lead or doesn't know how, by herding him into the trailer or other conveyance.

Park the trailer as close to where the animal lives as possible, block all exits except the trailer (you can use portable panels if you don't have five handy volunteers as I often do!), and apply herding pressure from behind.

Make sure the entry is safe, the footing is good, and put some grain or hay in the trailer if you want to, but no humans in the trailer. Frightened alpacas are very reluctant to get into a confined space with a human. Pressing animals toward other humans usually results in cushing or attempted escapes into or over the panels.

It is important to note as you read the following that success with animals like Carlotta is based on a philosophical approach, along with specific tools and techniques. Understanding the reasons why and when to use certain techniques or tools is as important as knowledge of the tools themselves. I knew that a big part of Carlotta's resistance had to do with defensive behaviors that she learned when she was hurt. Alpacas cush when they are uncertain, frustrated, and frightened.

During her medical treatment, she was overwhelmed, she was in pain, and she learned to withdraw totally from an unpleasant situation by shutting out everyone and everything. Carlotta didn't need these coping behaviors anymore, but she never stayed present long enough to find that out. ➤

The halter I use has rings on the noseband and allows me to attach a lead rope to the side of the nose. Signals given on a lead attached here feel very different from signals given under the chin. For non-resistant animals, signals under the chin can work just fine. But for animals that have learned to lay back on the lead it is very difficult to change that behavior, unless you change the location of the lead attachment – at least temporarily.

I used a very long lead. My training extension lead is about 2 metres long. Standing 2 metres away from Carlotta didn't look a thing like what she knew leading to be. It also gave her room to come forward without having to get very close to me.

I gave very, very light intermittent signals on the lead. Anything that resembled a heavy steady pull was sure to push Carlotta's "lie down" button.

I wish I could say that my plan went perfectly, that Carlotta was simply thrilled and never saw the need to lie down, but that was not the case. Even with my three-point plan in place, Carlotta opted to lie down almost before I had a chance to get started.

Her cushing behavior was automatic – she really acted without thinking.

I used several strategies to get her up. I opened the door to the catch pen, allowing her to use an additional area adjoining the catch pen. I stood behind her eye, basically herding her at first instead of leading her. When she cushed again, I made her get up.

There is a secret to getting a cushed alpaca up off the ground. First, it is useless to pull on the head. It will almost never work. Your best bet is to use the rear approach. Simply lifting the back end won't work, either. You must pick up the back end very quickly. I use two big handfuls of wool on the hips. The movement is up and forward, done at the same time you say "UP" very emphatically.

Make sure to let go of the wool after you have issued the command. Hold on too long and you will either find the animal sitting back down, or you might get kicked. The effect of this very quick up-and-forward movement is to put so much weight in the front half of the alpaca, that she will get up to keep from falling on her nose. I admit, it is also startling and maybe a bit unpleasant. Usually after doing this move once or twice, I need only say "UP" and the animal complies.

Sure enough, after two "UP's" and some room to move around, coupled with the other tools I mentioned earlier, we had Carlotta leading. As it turned out, Carlotta had no clue what a signal on the lead meant.

So after she was willing to remain standing, we worked on teaching her to respond to a signal. She turned out to be a very bright animal and very willing to change her attitude and behavior.

I led her using the long lead rope, inside a 1 metre square area, then took Carlotta out into a larger pasture. She had a few ups and downs, but became increasingly confident. Laurence took over and led Carlotta around a large pasture with very little difficulty. Best of all, Carlotta really seemed very pleased with herself.

So was it a weekend fluke? Laurence told me later, "Today, after continuing to practice and follow Marty's advice, Carlotta will walk with us anywhere we want her to go. At Marty's suggestion, we have also begun to use some simple obstacles to keep Carlotta interested in walking with us. She is a new animal. Not only is it easier to work with her, but she is much more pleasant to be with in the barn." ■

References

1 For more information about the 4-Point Approach and other techniques mentioned in this article, refer to the Summer 2000 issue of *Alpacas Australia* Magazine, as well as Marty's book, *The Camelid Companion.*

2 Halter fit was addressed in detail in Marty's column in the Autumn 2004 issue of *Alpacas Australia* Magazine.

For over 20 years, Marty McGee Bennett (B.S. Animal Behavior, University of Georgia) has traveled the world teaching camelid enthusiasts how to better understand and more successfully relate to these wonderful animals. The author of three books, including the best-selling Camelid Companion, and the star of seven instructional videos, Marty's work has transformed the way owners, breeders, and veterinarians handle and train alpacas. Marty can be reached at www.camelidynamics.com or marty@camelidynamics.com.

Photos courtesy of Marty McGee Bennett.

Laurence and his sister, Pam, are happy with Carlotta's progress. Best of all, Carlotta really seems very pleased with herself.

Business Card Directory

BUSINESS CARD ADVERTISEMENTS ONLY $110 PER ISSUE OR $88 PER ISSUE FOR 3-ISSUE BOOKINGS

PacaPics

Every picture does tell a story!

Alpacas Australia is always on the lookout for photos to publish. Serious or humorous, send us your favourite alpaca snaps and let your photos tell us about your stud in either the popular PacaPics pages or the prestigious position of magazine front cover.

The winner in the PacaPics feature will receive a complimentary business card size advertisement insertion in the next magazine. Front cover photo winner will also be awarded the same advertising opportunity as well as five complimentary copies of the magazine bearing their winning photo. The magazines will prove to be excellent promotional tools for your stud.

Send your photos to:
The Editor, *Alpacas Australia*,
PO Box 1076,
Mitcham North, VIC 3132.
Email sandra@alpaca.asn.au

✶ WINNER ✶

< While mum and dad are busy, I'll have a drink >

Jeanette Klomp • Aurora Alpacas, NZ

< Who invited you? This isn't a dog's breakfast >

Helen & Robert Crewe • Jandarra Alpacas, NSW

< Guess Who? >

Mike Nichols • Dynasty Alpacas, VIC

< Ooh, yummy pasta >

Josie Bugeja • Jarravale Alpacas, QLD

< If you guys won't share, I'm going straight to the top >

Steve Marshall • Stansbury Alpacas, SA

< *Ikie pat 'paca?* >

Phillip Austen • Concongella Alpacas, TAS

< *Stepping out* >

Cora Zyp • Coraz Alpacas, QLD

< *Playing possum in England* >

Jenny Macharg • Fowberry Alpacas, England

< *I have big black eyes too!* >

Lesley Maxwell • Kurralea Alpacas, NSW

< *Is there something in there for me?* >

Jan Sutherland • Somersby Alpacas, NSW

< *An apple a day keeps the vet away* >

Ian & Angela Preuss • Pinjarra Alpacas, VIC

< *The three musketeers* >

Odette Mayne • Currumbong Alpacas, ACT

< *A glass and a half of full cream milk* >

Monique & James Doherty • Destiny Alpacas, NSW

< *Do owners look like their animals ... or is it the other way around* >

Jan & John Bentley • Mundawora Alpacas, SA

< *Yes, a text book delivery* >

Robinanne & Gary Sheen
Amazing Aussie Alpacas, NSW

< *WA version of the Loch Ness Monster* >

Phillipa Sandercock • Ashburton Alpacas, WA

< *Don't come any closer* >

Rudi & Di Balde • Jannarie Alpacas, VIC

< *Is this my best side?* >

Monique & James Doherty • Destiny Alpacas, NSW

Upcoming Events

April

22-23 Alpaca Autumn Show: WA
Venue: Whiteman Park
Highlights: Alpaca and fleece judging
Contact: Pamela Brown (08) 9574 6050

22-23 2nd Alpaca Extravaganza: SA
Venue: Oakbank Racecourse
Highlights: Promotional display; demonstrations; alpaca products for sale
Contact: Jolyon Porter (08) 8568 5254

28-30 Hawkesbury Show: NSW
Venue: Hawkesbury Showgrounds, Clarendon
Highlights: Alpaca judging (29 April)
Contact: Cheryl Kosaras (02) 4573 1177

28-30 Bathurst Royal Show: NSW
Venue: Bathurst Showgrounds
Highlights: Fleece judging (27 April); Alpaca judging (30 April)
Contact: Kate Bailey (02) 6887 1233

30 Alpaca Sale Day: VIC
Venue: Yarra Glen Racecourse
Highlights: Alpaca sales; lectures and promotional display
Contact: Richard Watson (03) 5772 2497

May

4-6 Agfest: TAS
Venue: Oaks Rd., Carrick
Highlights: Promotional display; product sales
Contact: John Milward (03) 6391 1433

4-6 Agro Trend: QLD
Venue: Bundaberg
Highlights: Promotional display
Contact: Mary O'Shea (07) 5498 5508

5-7 Tocal Field Days: NSW
Venue: CB Alexander Agricultural College, Paterson
Highlights: Promotional display
Contact: Peter Tulip (02) 4934 1799

6 Information Day For New Breeders: WA
Venue: Fairbridge Village, Pinjarra
Highlights: Lectures; demonstrations
Contact: Pamela Brown (08) 9574 6050

7 Alpaca Field / Sale Day: WA
Venue: Youngs Siding
Highlights: Alpaca sales; promotional display
Contact: Lorraine Naylor 0418 936 548

11-13 Ipswich Show: QLD
Venue: Ipswich Showgrounds
Highlights: Alpaca judging; promotional display
Contact: Julie MacGregor (07) 3202 3113

13-14 New England Wool Expo and Alpaca Show: NSW
Venue: Armidale
Highlights: Alpaca and fleece judging
Contact: Catherine Mead (02) 6775 2524

18-20 Gympie Show: QLD
Venue: Gympie Showgrounds
Highlights: Alpaca and fleece judging
Contact: Mary O'Shea (07) 5498 5508

20 Alpaca Sale Day: WA
Venue: Pinjarra
Highlights: Alpaca sales; promotional display
Contact: Pamela Brown (08) 9574 6050

20-21 Alpaca Fiesta and Auction: NSW
Venue: Clarendon
Highlights: Alpaca auction; demonstrations; alpaca raffle
Contact: Brian Woodhouse-Young (02) 4571 2362

20-21 Stawell Good Life Festival: VIC
Venue: Stawell
Highlights: Alpaca and fleece judging; product sales; wether auction
Contact: Vivienne Grigg (03) 5428 6712

June

11 Alpacas On Parade: NSW
Venue: Maitland Showgrounds
Highlights: Alpaca auction; pen sales; lectures; fashion parade
Contact: Narelle Tulip (02) 4934 1799

15-17 Sunshine Coast Show: QLD
Venue: Nambour Showgrounds
Highlights: Alpaca judging
Contact: Mary O'Shea (07) 5498 5508

15-17 Primex: NSW
Venue: Casino
Highlights: Promotional display
Contact: Shayne Barnett (07) 3200 0585

July

1-2 Alpaca Fest: VIC
Venue: Werribee Equestrian Centre
Highlights: Alpaca and fleece judging; promotional display
Contact: Chris Day (03) 5368 7094

8-9 Mudgeeraba Show: QLD
Venue: Mudgeeraba Showgrounds
Highlights: Promotional display
Contact: Wendy Summerell (07) 5543 0207

9 Southern NSW Region Annual Show: NSW
Venue: Goulburn Showgrounds
Highlights: Alpaca judging
Contact: Mark Garner (02) 4884 1222

14-15 Mudgee Small Farm Field Days and Spring Alpaca Show: NSW
Venue: Mudgee
Highlights: Alpaca judging (15 July)
Contact: Judy Easten (02) 6372 1714

21-23 Farm Fantastic: QLD
Venue: Caboolture
Highlights: Promotional display
Contact: Mary O'Shea (07) 5498 5508

21-24 Australian Sheep and Wool Show: VIC
Venue: Bendigo Showgrounds
Highlights: Alpaca and fleece judging
Contact: Vivienne Grigg (03) 5428 6712

30 Ballarat Sheep and Wool Show: VIC
Venue: Ballarat Showgrounds
Highlights: Alpaca and fleece judging
Contact: Vivienne Grigg (03) 5428 6712

August

7-8 Hamilton Sheepvention: VIC
Venue: Hamilton Showgrounds
Highlights: Alpaca and fleece judging
Contact: Andrew McCosh (03) 5565 9413

10-19 Royal Queensland Show: QLD
Venue: Brisbane Showgrounds
Highlights: Alpaca judging (18 August) Fleece judging
Contact: Camilla Smith (07) 3408 7639

18-20 AAA National Alpaca Conference: SA
Venue: Adelaide Convention Centre
Highlights: Lectures on latest industry developments
Contact: Convenor, Jolyon Porter (08) 8568 5254

27 Totally Alpaca Field Day and Auction: NSW
Venue: Goulburn Showgrounds
Highlights: Alpaca auction; promotional display
Contact: Geoff Shephard (02) 6227 6202

31-2/9 Gold Coast Show: QLD
Venue: Parklands
Highlights: Alpaca judging (2 Sept)
Contact: Mary O'Shea (07) 5498 5508

Advertising

Rates

	Casual Rate		x 2 issues		x 3 issues		Production*	
	$AUD Incl. GST AUSTRALIA	$AUD OVERSEAS	$AUD Incl. GST AUSTRALIA	$AUD OVERSEAS	$AUD Incl. GST AUSTRALIA	$AUD OVERSEAS	$AUD Incl. GST AUSTRALIA	$AUD OVERSEAS
4 colour								
Full Page	1,045.00	950.00	973.50	885.00	825.00	750.00	308.00	280.00
1/2 Page	737.00	670.00	682.00	620.00	583.00	530.00	231.00	210.00
1/4 Page	638.00	580.00	583.00	530.00	495.00	450.00	154.00	140.00
Mono								
Full Page	737.00	670.00	682.00	620.00	583.00	530.00	220.00	200.00
1/2 Page	517.00	470.00	484.00	440.00	418.00	380.00	154.00	140.00
1/4 Page	297.00	270.00	275.00	250.00	242.00	220.00	88.00	80.00
Bus. cards	110.00	100.00	99.00	90.00	88.00	80.00	N/A	N/A

Loading for Specified Positions

Outside Back Cover	+ 25%
Inside Front Cover	+ 20%
Inside Back Cover	+ 15%
Right Hand Page	+ 10%
Specific Positions	+ 10%
Double Page Spread	price on application

***Production costs include**
Layout, typesetting and electronic finished artwork and low resolution proofs (high resolution extra)

Additional Costs

Colour scanning	$40.00 per photograph
Mono scanning	$30.00 per photograph

Space and Sizes (mm)

Full Page
Image: 188 x 275
Trim: A4 (210 x 297)
allow 5mm bleed all sides

1/2 Page
188 x 123

1/4 page
91 x 123

Business Card
90 x 55

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@bigpond.com.au

Deadlines

Issue 50: Winter
Due: August 2006
Deadline: Friday 2 June 2006

Issue 51: Summer
Due: December 2006
Deadline: Friday 6 October 2006

Issue 52: Autumn
Due: April 2007
Deadline: Friday 16 February 2007

Please book and send all editorial and advertising material to Sandra Wright
Australian Alpaca Association Inc. (A0021333P • ABN 33 710 945 160 • ARBN 067 146 481)
PO Box 1076, Mitcham North, Victoria 3132 Australia
PHONE **+61 (0)3 9873 7700** • FAX **+61 (0)3 9873 7711** • EMAIL **sandra@alpaca.asn.au**

Order Form

Free Information Kit

☐ I am not a member of the Australian Alpaca Association but am interested in learning more about alpacas. **Please send me a FREE alpaca information kit.**

TOTAL $AUD
$0.00

Subscription

I would like to subscribe to three issues of *Alpacas Australia* Magazine
☐ Australia $AUD 28.05 ☐ New Zealand $AUD 40.00 ☐ Overseas $AUD 50.00 $

Publications

	$AUD WITHIN AUSTRALIA Incl. GST - Incl. P&H within Aust only	$AUD OVERSEAS PLUS P&H Please contact AAA for specific P&H charges	
ABC for Alpaca Owners by McMillan & Jinks	35.20	30.00	$
Alpaca Breeders Reproduction Handbook by McMillan & Jinks	27.20	22.70	$
Alpaca Fibre – An Introduction by Watt I	9.80	8.00	$
The Camelid Companion by McGee Bennett	price on application		$
The Complete Alpaca Book by Eric Hoffman, with Contributing Authors	price on application		$
The International Alpaca Handbook by Alpaca Consulting Services of Australia	61.00	45.50	$
Managing Alpacas in Australia, AAA - Education & Training Publication	4.00 ea	2.70 ea	$
For orders in excess of 10 copies ** within Aust. only $2.50 per copy (plus P&H)	**	2.20 ea	$
Medicine & Surgery of South American Camelids by Fowler M (2nd edition)	price on application		$
Alpacas Australia Magazine – 3 back issues	18.90	9.00	$
Herd Book ☐ Vol 1 ☐ Vol 2 ☐ Vol 3 ☐ Vol 4 (per volume)	19.80 ea	15.00 ea	$
Herd Book Vol 5	26.90	18.00	$
Herd Book Vol 6	29.10	18.00	$
Herd Book Vol 7	33.50	22.00	$
Herd Book Vol 8	40.10	27.00	$
Herd Book Vol 9	40.10	27.00	$
Herd Book Vol 10	46.20	32.00	$
Herd Book Vol 11	48.50	34.10	$
Herd Book Vol 12	57.00	42.00	$
Herd Book Vol 13	63.60	46.00	$
Herd Book - CD Format ☐ Vol 12 ☐ Vol 13	15.40	10.00	$
Conference Proceedings ☐ Glenelg, SA 1999 ☐ Canberra, ACT 2000	28.60	23.00	$
☐ Hobart, TAS 2004	41.00	27.00	$
TOTAL			**$**

NOTE: With the exception of ** (shown above) all prices are $AUD inclusive of P&H within Australia only.
Overseas orders, contact the Association for specific postage charges.

Name (PLEASE PRINT) MR / MRS / MS/ MISS / DR

Address

State Postcode Country

☐ I enclose my cheque /money order for $AUD
(required in Australian dollars drawn on an Australian bank and made payable to 'Australian Alpaca Association Inc'.)

☐ Please debit my credit card for the amount of $AUD ☐ Mastercard ☐ Bankcard ☐ Visa

Please note: Minimum transaction amount for credit card payment is $AUD 15.00

Credit Card No ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry Date / /

CCV No ☐☐☐ (Credit Card Verification (CCV) - the last 3 numbers on the signature strip on the back of your Credit Card)

Name on Credit Card Signature

Copy or cut out this form and send to Australian Alpaca Association Inc. A0021333P • ABN 33 710 945 160 • ARBN 067 146 481
PO Box 1076, Mitcham North, Victoria 3132 Australia • PHONE +61 (0)3 9873 7700 • FAX +61 (0)3 9873 7711

Flowerdale Estate Alpacas is offering a 2 day, weekend workshop on alpaca nutrition and pasture improvement on May 27 & 28.

Some of the topics to be covered are:

- how alpaca digestion works
- how much and what to feed
- how to body condition score
- vitamin and mineral requirements
- use of supplements
- nutrition for crias
- the case for improving pastures
- soil testing
- an ideal alpaca pasture seed mix
- grazing management through pasture rotation
- sustainable agriculture
- choose your pasture and change your weeds simply by balacing your soils

Full details are at www.flowerdalealpacas.net

Specialists in their field, Dr Jane Vaughan and Joe McKenzie will facilitate the weekend. Dr Vaughan is acknowledged as a leading veterinarian, specializing in alpaca and llama nutrition and embryo transfer technologies.

The Flowerdale Estate farm is in the second stage of an eight year program that will see the property completely customized for breeding alpacas. You are invited to inspect the pasture improvements, as part of the Nutrition Weekend in May.

Haydn and Jeffry Farman of Flowerdale Estate Alpacas

Joe McKenzie is sales manager of Hybrid Industries. Hybrid Ag provide sustainable solutions for agriculture and have been involved in the 8 year pasture improvement program at Flowerdale Estate.

ALPACA NUTRITION & PASTURE IMPROVEMENT WORKSHOP.

The Venue.

Flowerdale Estate is an award-winning residential corporate retreat for up to 60 people. Stay in luxury accommodation and let the chefs tempt you with their award-winning menus. These workshops have also been a wonderful opportunity for alpaca breeders to network and socialize. Many lasting friendships have started at these weekend events.

The Weekend Package.

Relax in the heated pool. Play some tennis. Workout in the gym. Enjoy a sauna or challenge someone to a game of billiards. And at the end of the day, share a pre dinner drink and a delicious savoury or two. The price per couple is $625. The single price is $425. The package includes en-suite accommodation for Saturday night, Saturday and Sunday lunch, morning teas, Saturday night dinner, workshop tuition and all course materials.

Bookings.

Attendance numbers for both weekends are limited and will fill quickly. Complete details including directions and booking forms are on the website at www.flowerdalealpacas.net

Or phone Kim on 03 9728 7000.

WORKSHOPS FOR NEW BREEDERS.

Flowerdale Estate Alpacas also run popular workshop weekends for new breeders.

The Program.

Workshops include classroom learning and practical sessions in the barn, working with animals. Learn the basics: halter training, chuckering, weighing, body condition scoring, nutrition, mating, spit-offs, birthing, cria care, weaning, shearing, fibre classing, vaccinations, drenching, toenail trimming, and record keeping. There are sessions on goal setting, farm planning, pasture improvement, herd development strategies, business plans and marketing.

Book now for May 6 & 7

FLOWERDALE ESTATE

Flowerdale Estate Alpacas is offering a 2 day, weekend workshop on alpaca nutrition and pasture improvement on May 27 & 28.

Some of the topics to be covered are:

- how alpaca digestion works
- how much and what to feed
- how to body condition score
- vitamin and mineral requirements
- use of supplements
- nutrition for crias
- the case for improving pastures
- soil testing
- an ideal alpaca pasture seed mix
- grazing management through pasture rotation
- sustainable agriculture
- choose your pasture and change your weeds simply by balacing your soils

Full details are at www.flowerdalealpacas.net

Specialists in their field, Dr Jane Vaughan and Joe McKenzie will facilitate the weekend. Dr Vaughan is acknowledged as a leading veterinarian, specializing in alpaca and llama nutrition and embryo transfer technologies.

The Flowerdale Estate farm is in the second stage of an eight year program that will see the property completely customized for breeding alpacas. You are invited to inspect the pasture improvements, as part of the Nutrition Weekend in May.

Haydn and jeffry Farman of Flowerdale Estate Alpacas

Joe McKenzie is sales manager of Hybrid Industries. Hybrid Ag provide sustainable solutions for agriculture and have been involved in the 8 year pasture improvement program at Flowerdale Estate.

ALPACA NUTRITION & PASTURE IMPROVEMENT WORKSHOP.

The Venue.

Flowerdale Estate is an award-winning residential corporate retreat for up to 60 people. Stay in luxury accommodation and let the chefs tempt you with their award-winning menus. These workshops have also been a wonderful opportunity for alpaca breeders to network and socialize. Many lasting friendships have started at these weekend events.

The Weekend Package.

Relax in the heated pool. Play some tennis. Workout in the gym. Enjoy a sauna or challenge someone to a game of billiards. And at the end of the day, share a pre dinner drink and a delicious savoury or two. The price per couple is $625. The single price is $425. The package includes en-suite accommodation for Saturday night, Saturday and Sunday lunch, morning teas, Saturday night dinner, workshop tuition and all course materials.

Bookings.

Attendance numbers for both weekends are limited and will fill quickly. Complete details including directions and booking forms are on the website at www.flowerdalealpacas.net

Or phone Kim on 03 9728 7000.

WORKSHOPS FOR NEW BREEDERS.

Flowerdale Estate Alpacas also run popular workshop weekends for new breeders.

The Program.

Workshops include classroom learning and practical sessions in the barn, working with animals. Learn the basics: halter training, chuckering, weighing, body condition scoring, nutrition, mating, spit-offs, birthing, cria care, weaning, shearing, fibre classing, vaccinations, drenching, toenail trimming, and record keeping. There are sessions on goal setting, farm planning, pasture improvement, herd development strategies, business plans and marketing.

Book now for May 6 & 7

FLOWERDALE ESTATE
ALPACAS