

2010 Bomac Lecture Series

Medicating vs. Doping in Equestrian Competition and Racing and all you need to know about Backs



The NZ Equine Research Foundation is delighted to have Professor Leo Jeffcott back to once again present at this year's Bomac Lecture Series. We are following last year's successful format with one speaker presenting four papers over an afternoon at five venues throughout New Zealand.

Professor Jeffcott graduated from the Royal Veterinary College, London in 1967. After graduation he went to the Animal Health Trust in Suffolk, where he completed a PhD on passive transfer of immunity in foals. In 1982 he took up an appointment as Professor of Veterinary Clinical Sciences at the University of Melbourne where he stayed for 9 years. Two years later he became Dean of the Veterinary School in Cambridge, UK. In October 2004 he returned to Australia to become Dean at the University of Sydney. He retired as Dean in November 2009 and currently works part time in the Veterinary Teaching Hospital in Camden, NSW.

Professor Jeffcott has been an accredited Event Veterinarian for the Federation Equestre Internationale (FEI) for over 30 years. He has been a Veterinary Delegate at four World Equestrian Games. He has officiated at eight World Cups and countless Three Day Events and has been an official veterinarian for six Olympic Games. He was made an Honorary Member of the FEI Bureau in 2006 and is the first veterinarian to receive this honour. He carried out extensive research on horses competing under hot/humid conditions and the effects of the weather.

Professor Jeffcott will be presenting lectures on drugs used in all equestrian sports - how big a problem is doping and what are the equine codes doing about them? He will also talk about his research into back and sacroiliac problems. A "must attend" for all horse owners and trainers. The lectures will run from 1 pm to 5.30pm at the following venues:

| | | | |
|------------------|-----------|-------------------------|----------------------|
| Matamata | Sunday | 15 th August | Matamata Club Inc |
| Palmerston North | Wednesday | 18 th August | Awapuni Racecourse |
| Invercargill | Friday | 20 th August | Ascot Park Hotel |
| Christchurch | Sunday | 22 nd August | Riccarton Racecourse |
| Auckland | Thursday | 26 th August | Karaka Sales Complex |

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NZERF Funded Research for 2010!

Freezing semen from your colt at the time of gelding.

Lee Morris BVSc DVSc DipACT, EquiBreed NZ Ltd, Cambridge. www.equibreed.co.nz

Have you ever wished you had semen from your gelding? Or have you had the misfortune of losing your stallion? With thanks to the NZERF, a study will be undertaken this season by EquiBreed NZ Ltd to evaluate the fertility of semen obtained from colts at the time of gelding. Every year, a large number of colts are gelded in the Standardbred and Sporthorse industries. At the time of gelding the genetic potential of these colts is lost. Frozen semen is the best way to preserve the genetics of an individual male for an indefinite period. Furthermore, many breeders do not want to train their young colts to collect semen for freezing due to management issues. Because of training or breaking in regimes they do not want their geldings to have learnt "mating" behaviour. If we are able to successfully freeze semen from colts at the time of gelding, we should be able to use the same technology to freeze semen from stallions at the time of death or indeed from endangered species.

After spermatozoa are produced in the testes, they are stored in the epididymis, which is attached to the testis. During this storage period the sperm acquire the potential for motility and ultimately fertility. We have previously shown that the fertility of epididymal spermatozoa is lower than ejaculated spermatozoa and further investigation into ways to overcome this lower fertility are required. Studies in the fertility of epididymal spermatozoa will also provide insight into what factors contribute to stallion fertility, the longevity of sperm and our ability to



chill or freeze semen.

It is possible to recover and freeze epididymal spermatozoa from the epididymis at the time of gelding for future use. Our previous work has revealed that on average, it is possible to recover and freeze approximately 30-40 doses

of epididymal spermatozoa from a 2 year-old colt at the time of gelding. In 2007 we produced the first foal, Emily Rose, by epididymal sperm in New Zealand. Since then we have improved our semen freezing technology and made further modifications to the freezing of epididymal spermatozoa.

This season EquiBreed NZ Ltd will have a postgraduate Biology student from the University of Waikato who will be undertaking her Masters degree in the fertility of epididymal spermatozoa. Sperm will be recovered from the epididymis at the time of gelding and frozen using the latest semen freezing technology.

Over the last 9 years we have developed a semen diluent to enhance the fertility of epididymal sperm. This diluent will be mixed with the sperm and mares will then be inseminated to test the diluent and determine which factors affect the fertility of frozen epididymal spermatozoa.

We are very grateful to the NZERF for their funding and look forward to providing some exciting pregnancy results using epididymal spermatozoa. This technology will allow you to be able to breed from your colts well after they have been gelded.

Filling the Gap in Tendon Healing

Sarah L. Taylor BVetMed, BSc, PhD student, Equine Hospital, Massey University, Palmerston North

Tendon injuries in horses are extremely difficult to treat and unfortunately occur frequently in equine athletes. Healing is generally prolonged and is accompanied by formation of significant scar tissue that is weaker than the original undamaged tissue; this often results in re-injury when training is resumed (Figures A-C). Normal tendon is composed mainly of type I collagen whilst repaired tendon contains type III collagen which is mechanically weaker. No reliable treatments for tendon damage have yet been found. One of the main reasons for this lack of therapeutic progress is because the process of repair is not well understood. Understanding the mechanisms involved in the early stages of tendon damage would permit design of specific therapies to improve the chances of successful healing.

This project aims to investigate the role of Connexins in tendon injury and healing. Connexin proteins form gap junctions, which function to physically link tendon cells and permit cells to communicate with each other (Figure D). Gap junctions are involved in development, healing and the spread of cell death following injury. Manipulating gap junction levels has been shown to reduce injury and inflammation and to improve wound healing in other areas of the body such as the eye and skin. In tendon cells of other species, altering gap junction protein expression has also been shown to increase the amount of beneficial type I collagen. The goal of this project is to investigate whether manipulation of gap junction activity in horse tendon cells improves healing. Initially, these studies will be conducted in cell cultures in the laboratory, but successful results may lead to development of specific, scientific based therapies to accelerate healing and reduce scar tissue formation in

equine tendon. Altering the level of these proteins and assessing the effect of that on tendon healing are the aims of this project.

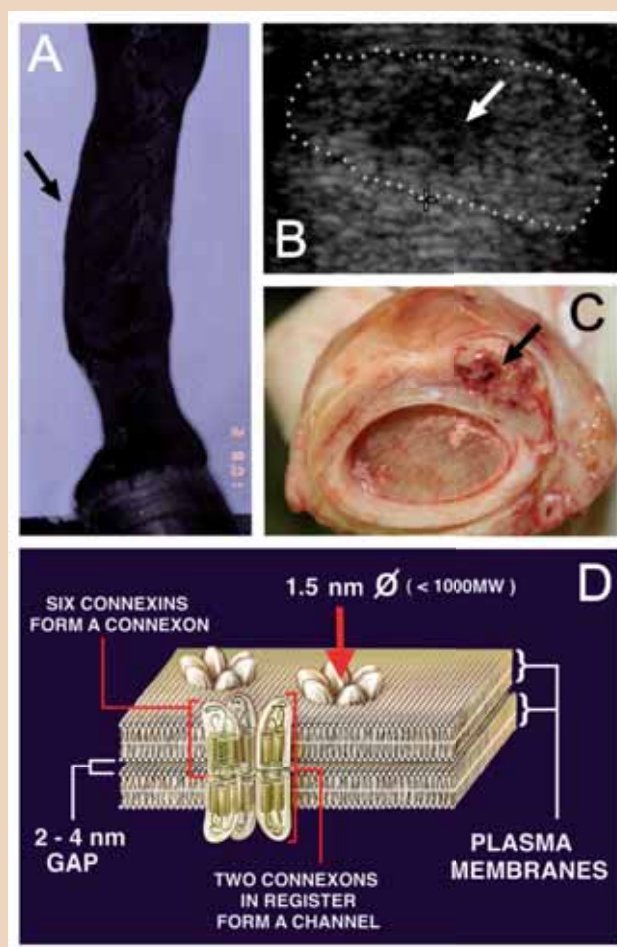


Figure A: Bowed Superficial Digital flexor tendon (arrow).

Figure B: Ultrasound image of equine flexor tendon, arrow indicating the injured area, which appears as a dark 'core lesion'.

Figure C: Post mortem image of damaged tendon, with arrow indicating haemorrhage in the swollen tendon.

Figure D: Cartoon of connexin proteins forming a gap junction in the plasma membrane of a cell. Six connexins group together to form a pore through which adjacent cells can transfer molecules. (Image is courtesy of Prof C. Green, Auckland University).

Current Equine Research Needs

In July last year the NZ Equine Research Foundation commissioned an online survey into the “Current Research Needs of the NZ Equine Industry”. We tested the survey on our Board members and then the final forms were sent by email to 200 selected equine industry people. We tried to get a balanced representation across the whole industry and we are very grateful to everyone who completed the survey.

We undertake this type of review every five years and use the information gained to help us prioritise research applications and, dependent on funding, to commission work in important areas where applications have not been received.

| Feeding and Nutrition | Percentage Categorized as ≥Important |
|--|--------------------------------------|
| Nutrition of the horse in training/ racing/competition | 91% |
| Nutrition of the weaned foal (Autumn/Winter) | 84% |
| Nutrition of the yearling (Spring/ Summer) | 84% |
| Growth and Development | |
| Methods to improve the bone and cartilage growth of the young horse | 84% |
| Studies on minimising developmental problems of foals and yearlings including bone diseases such as epiphysitis, angular limb deformities etc. | 82% |
| Horses in Work/Training | |
| Shin soreness, joint, tendon, foot problems | 90% |
| Tying up and muscle problems etc. | 85% |
| Advisory Systems | |
| Systems to ensure improvement in how knowledge reaches the industry | 82% |
| Development of systems to ensure that welfare issues are understood and that good practices are carried out | 83% |
| Breeding | |
| Methods to diagnose and treat health problems in foals | 89% |
| Methods to Improve Control of Parasites | |
| Worming regimens | 88% |

This is the first time we have undertaken an online survey. The survey form was based on previous questionnaires and asked respondents to rank various topics in degrees of importance and to make suggestions on other topics they thought should be researched.

Most of the respondents to the survey were involved with horses as a business (78%) rather than for leisure. They had been involved for a long time (70% for 20-50 years), they were spread evenly across industry sectors and their annual investment in the industry was generally high (40% spending \$50000 to \$1m plus).

Of the responses to the survey questions the following list are topics respondents considered most important for further research. The figure shown is the percentage of respondents that put the topic in the “important” and “very important” categories:

The comments after each section and the responses to the request to identify the three most important topics requiring research generally supported these priorities. There were topics included in the individual priorities that deserve further discussion and investigation. A number of respondents commented on the need to make research information more readily available and accessible. Some of the selected topics have been well researched, but obviously the information is failing to reach the equine industry. Better dissemination of equine research to the industry is needed.

As you would expect there are some variations between different industry sectors on the relative importance of some topics. These can be addressed at a later date with the respective sector bodies.

This review of what the NZ horse industry thinks should be researched will be a big help in deciding our research and educational priorities over the next five years.

Another Kiwi Researcher Honoured

Our very own Professor Joe Mayhew has been inducted into the University of Kentucky Equine Research Hall of Fame. Joe was recognised for his wonderful contribution over forty years to our understanding of diseases involving the nervous system of horses. He joins a very select group of twenty-three international equine researchers, who include fellow kiwis Professors Wayne McIlwraith of Colorado State University and “Twink” Allen of Newmarket

Joe was a founding graduate of Massey University Vet School in 1968. After practicing in Wanganui he undertook graduate clinical training and research in North America and taught at Vet



Joe Mayhew and his wife, Rachel, with former recipient and fellow Kiwi Wayne McIlwraith

Schools in the USA and UK. He and wife Rachel (affectionately known as “Buzz”) have been back in New Zealand for about three and a half years during which time Joe has been working at Massey continuing his clinical practice, teaching and research and as the Group

Leader of Massey Equine. We were delighted to have Joe join the NZERF Board and he brings a wealth of experience to our deliberations. He is on our Technical Committee and it is great to have someone representing the Institute of Veterinary and Biomedical Sciences at Massey University.

Our congratulations to Joe on this well deserved recognition for his equine research work.

Waikato Stud Young Achiever Award

Young people (35 years and under) throughout the “Horse Industry” are reminded of the opportunity to apply for this annual grant of \$15,000 aimed at assisting them

in their career development. Applications close on the 31st of October each year. Application forms are available from the Secretary or on our website.

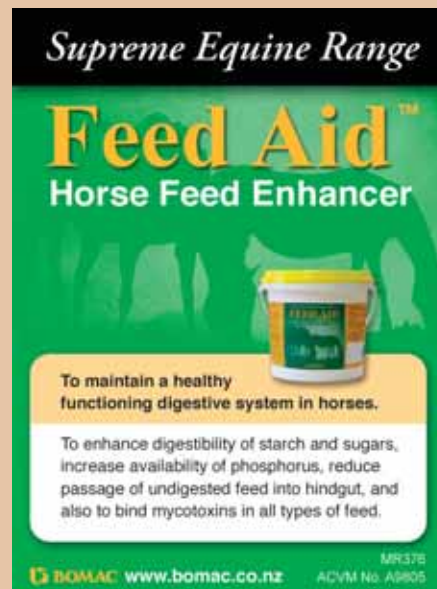


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Review of Safety of Turf Versus Non-Turf (Synthetic and Dirt) Racing Surfaces

Andrew F. Clarke, BVSc, PhD

Retrospective studies of fatal injuries sustained while racing, have been conducted all over the world looking at the affect of the racing surface. They have found worldwide that turf surfaces result in significantly lower injury rates than non-turf tracks. In the UK turf tracks reported 0.38 fatal injuries/1000 starters on turf, whereas all weather surfaces reported 0.72 fatal injuries. Hong Kong and the United States have reported similar results. In Victoria, Australia, where the only racing surface was turf, they report a much lower total injury rate than other countries.

In 2007 a synthetic track was commissioned in Victoria and that track reported a significantly higher fatality rate than turf tracks in that state. In May 2009 racing was suspended on that track until upgrades could be completed. It appears that the problems with synthetic tracks are due to upkeep and maintenance issues. In the US synthetic tracks have significantly less fatalities per start than dirt tracks.

One study in the US showed that synthetic tracks were safer than turf tracks, but this is likely due to the poor quality of turf tracks used in the study. Turf tracks are not necessarily the universal remedy for decreasing injury and fatality. Quality and care of turf surfaces has significant impact on injury rate.

In the last 20 years a new turf surface has been used in some racing jurisdictions in Australia, Hong Kong and Singapore. This is called engineered profile turf (EPT) natural turf. These tracks have some of the lowest injury rates in the world. The system

incorporates a mesh element into the growing medium creating a hardwearing durable surface. These tracks have hosted up to 65 racing day meetings in 1 year. The drainage system allows optimal racing conditions in a wide range of weather. The main factor that limits traditional turf tracks is loss of drainage as the root zone compacts. The natural lifespan of a traditional track is 7-15 years, whereas the EPT is estimated to have a lifespan of 30 years. The track in Hong Kong is currently 18 years of age.

Much focus is placed on race-day injury, but it is also important to consider the affect of training regimes and surfaces on injury rates. A study in Hong Kong suggested that the type of injury seen race-day probably reflected the “intensive use of all weather tracks for training.” More research is needed to look at the interactions between racing and training surfaces.

Adpated from AAEP Proceeding 2009



Ability to Race of 518 Thoroughbred Weanlings and Yearlings After Arthroscopic Debridement of Femoropatellar Osteochondritis Dissecans (OCD)

Deborah L Spike Pierce, DVM and Larry R. Bramlage DVM MS

This study looked at the ability of young thoroughbred horses to race after arthroscopic surgery of the stifle joint for OCD. The horses were divided into 5 categories based on the radiographic appearance of the lesions. Grade 0: no radiographic lesion, Grade 1: ≤ 20 mm, Grade 2: >20 to ≤ 40 mm, Grade 3: >40 to ≤ 60 mm, and Grade 4: >60 mm.

The horses with lesions classified as Grade 3 or lower were as likely as any thoroughbred to have a race day start. In fact Grade 1-3 had a higher percentage of horses start races than the breed average from the same period of time. This may however, reflect the quality of the horses that are being operated on. The authors concluded that thoroughbreds <2 yrs of age have a favorable prognosis to race after arthroscopic surgery for stifle OCD.

Adapted from AAEP proceeding 2009

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Chairperson's Corner



We were sad to learn in early November 2009 of the death of Ralph Kermod. Ralph had been a board member on the NZERF representing Harness Racing NZ for many years and had resigned due to ill health three years ago. He made a terrific contribution to our organisation and with his background in education, he made many of our publications,

especially various booklets, very readable to ordinary horse people. As many readers will know, Ralph had considerable success breeding and racing horses in both harness and thoroughbred codes under the banner of Northope Stud, just north of Palmerston North. He was very balanced in his opinions and helped our organisation to be a forum for understanding and respect across all industry sectors. He will be sadly missed and our sympathy goes to his wife Judy and family.

We were delighted with the number and quality of applications for a veterinarian and farrier to attend the Hoof Care Summit in Cincinnati, Ohio, USA early in 2010. With the success of

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this program in developing improved communication and cooperation between vets and farriers, we decided to assist four individuals from two locations in New Zealand to the Summit. They are veterinarian Rebecca Sutorius and farrier Stuart Muir of Rangiora, and veterinarian Orla Fahey of Hamilton and farrier Kim Hughes of

Cambridge. We look forward to hearing from them on their return with information on the latest advances in hoof care.

You will see in this issue, a brief report on the online survey into "Current Research Needs of the NZ Equine Industry" undertaken for us by IER in Australia. I would like to thank

my Board for their work in putting together the contact details of the approximately 200 industry people surveyed. We hope to use this list as well as the contact details we have gathered at such events as the Bomac Lecture Series, to inform equine people of NZERF news.

Acknowledgements

The New Zealand Equine Research Foundation gratefully acknowledges the following organisations who gratuitously distribute the 15,000 Bulletins we produce for horsemen and women throughout the New Zealand Horse Industry.

| | |
|---|------------------------------------|
| The NZ Thoroughbred Breeders' Association | (Newsletter) |
| NZ Thoroughbred Racing | (NZTR Thoroughbred Racing Monthly) |
| Harness Racing New Zealand | (Harness Racing Weekly) |
| The NZ Standardbred Breeders' Association | (Newsletter) |
| The NZ Equestrian Federation | (N.Z.E.F. Bulletin) |
| The NZ Equine Veterinary Association | (Equine Veterinary Practitioner) |
| NZ Farriers Association (Inc) | (N.Z.F.A. Newsletter) |
| Taranaki Miniature Horses | (Newsletter) |
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| NZ Hanoverian Society (Inc.) | (Newsletter) |

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