New Zealand to host the International Symposium on Equine Reproduction in 2014

A local organising committee chaired by Dr Lee Morris, Cambridge, NZ, comprising members from Australia and New Zealand, were successful in their bid to host this prestigious Symposium in January, 2014, at the Gallagher Academy of Performing Arts, University of Waikato. This is an exciting opportunity for New Zealand to welcome top scientists from around the world who specialize in equine reproduction.

The first International Symposium on Equine Reproduction was held in Cambridge, UK, in July 1974, initiated by a group of “founding fathers” of equine reproduction led by Dr Twink Allen (Cambridge, England). The purpose of the meeting was to provide a forum for biologists and veterinarians from around the world interested in equine reproduction to exchange and argue their views, to review the present state of knowledge of the subject, to produce guidelines for future research, and to foster international friendship and collaboration. The meeting provided a forum for exchange of information on clinical and basic research aspects of equine reproduction and the proceedings, entitled ‘Equine Reproduction’, were published as a supplement of the Journal of Reproduction and Fertility. This was the start of a successful and productive series of symposia on equine reproduction.

The second International Symposium on Equine Reproduction was held four years later (July 1978) at the University of California, Davis, USA. Eighty-three papers were presented on basic and clinical research in all aspects of equine reproduction and again published as a supplement to the Journal of Reproduction and Fertility. The proceedings of both these meetings are still widely quoted in the current literature. A tradition was born.

Since 1978, the International Symposium on Equine Reproduction has continued to be organised every four years: Sydney, Australia 1982; Calgary, Canada 1986; Deauville, France 1990; Caxambu, Brazil 1994; Onderstepoort, South Africa 1998; Fort Collins, Colorado USA, 2002; Kerkrade, the Netherlands, 2006 and Lexington, Kentucky USA, 2010.

Satellite Symposium: Breeders’ Seminar
In June this year, a satellite meeting of the 2014 Symposium will be held at Waikato University’s Gallagher Academy of performing Arts. This Breeders’ Seminar is open to anyone with an interest in equine reproduction, whether breeders, stud masters or veterinarians. Over 2 days international speakers will provide the latest information on a range of topics, including stallion behaviour and training, handling semen for shipping, pre-purchase breeding exams, mare management for natural mating and AI, interesting cases of mare and stallion infertility, problem foalings, foal health, and new technologies. A separate “wet lab” will be held on Monday 1st July. An advertisement for this seminar is in this Bulletin.

The NZ Equine Research Foundation is pleased to offer support in the hosting of the Symposium and welcoming veterinarians and scientists from around the world to New Zealand.
**Equine Metabolic Syndrome: Is it just fat ponies that founder?**

*Dr Michelle Logan (Dicken) MA VetMB MACVSc (Medicine of Horses) Cert AVP(ESST) MRCVS*

**What is equine metabolic syndrome (EMS)?**

- EMS is diagnosed when a horse or pony is overweight or carrying fatty deposits (or used to be like this but has been managed so is no longer overweight)
- has a history of, or evidence of, laminitis or being prone to laminitis
- and has insulin resistance

There are similarities between EMS and type-2 diabetes in humans. In both diseases a metabolic state is reached when there appears to be a constant state of low-grade inflammation. In humans this seems to have effects on our arteries whereas in horses and ponies it tends to affect their feet, which shows up as laminitis (founder). An important point is that it is not just ponies that can develop EMS; Standardbreds, Warmbloods and Quarter Horses are amongst those that have been diagnosed with EMS in these early days of testing.

**How do we diagnose it?**

We all know of, fat, cresty-necked ponies or horses with ‘cellulite’ that are prone to laminitis and we always thought that there was not much we could do for them apart from put them in the starvation paddock and keep their feet trimmed.

Now we can test to see if they have insulin resistance and, if so, there are some treatments that, together with an all-important diet and exercise programme may help.

A blood test to show insulin levels after being fasted overnight will diagnose a lot of these cases as they will have high insulin levels, but not all cases will show up on this test. A more accurate test is for the pony to be starved overnight then be fed a measured amount of glucose or dextrose powder in a small amount of chaff and a blood sample taken for insulin and glucose levels 2 hours later. This test has only recently been developed in the UK and we do not have enough information on lab tests for horse insulin levels performed in NZ, nor do we have reference ranges for normal horses in NZ. The New Zealand Equine Research Foundation (NZERF) is providing funding to cover the laboratory fees for an investigation in NZ where this test is performed on a normal horse and a suspected insulin resistant horse or pony at the same time and in the same area. This will enable us to:

1. Determine reference ranges of normal insulin levels for horses and ponies without equine metabolic syndrome and thus to determine a cut off for the diagnosis of EMS in New Zealand.
2. Determine the proportion of EMS positive horses that can be shown to be positive on a single sample in New Zealand (compared to glucose stimulation testing).
3. Determine the proportion of those suspected to be EMS positive that are found to be insulin resistant on testing in New Zealand.
4. Assess the validities of proxies based on insulin and glucose levels from a single sample. If these work then in the future EMS will be able to be better diagnosed from one blood sample.

This research will give us important information on EMS in New Zealand horses and ponies. New Zealand horses are subjected to different management practices than Northern Hemisphere horses in that most are kept outdoors all year round, and grass appears to be a major factor in the onset of EMS. If we can diagnose and manage horses with EMS more effectively then it will prevent a lot of suffering due to laminitis and give these patients longer, healthier lives. If EMS is diagnosed then your veterinarian will work with you to develop a treatment programme.

**Treatment**

The treatment is three fold and involves diet, exercise and medication. Also, of course, the feet need to be trimmed by an experienced farrier.

- **Diet:** if your horse/pony is positive for metabolic syndrome you will be advised on feeding a weighed amount of hay together with a balanced vitamin and mineral supplement. Regular monitoring with weigh bands/weight tapes and neck measurement will track the weight loss.

- **Exercise:** As long as there is minimal/no lameness then an exercise programme has been shown to reduce insulin resistance. This can be ridden work or lunging, building up to 20-30 minutes, 5-6 times a week. Just turn-out does not appear to be effective; there has to be a committed exercise programme.

- **Medication:** Metformin is used in humans to increase insulin sensitivity. It is used widely in the UK for horses with EMS and has started to be used in New Zealand, although we have to remember that it is not yet licensed for use in horses. It comes in tablet form, is given twice a day and is reasonably priced.

**Monitoring**

Ideally your horse/pony should be re-tested 3-4 weeks after starting the treatment programme to ensure there has been a reduction in the insulin resistance.
Any suspect cases?
Several horses and ponies have already been tested and put onto treatment but there is funding for more to be tested. If you suspect that you may have a horse or pony with EMS and are interested in finding out more then please contact your local veterinarian for information and mention the NZERF study.

They can then contact Dr Michelle Logan, NSVets, Riversdale [michelle_dicken@hotmail.com] who is undertaking the study together with Professor Joe Mayhew and Dr Erica Gee from Massey University.

We will bring you the results of this New Zealand study when all the test results have been analysed.

2013 Bayer Lecture Series
The NZERF is pleased to announce the key-note speaker for this year’s Bayer Lecture Series, Dr Erica Gee. Dr Gee will be speaking on the topic: “WHAT’S NEW IN FEEDING HORSES IN NZ?”

The lecture will be divided into 4 sessions with the following topics:

• Pastures and horses: what’s good, bad or otherwise?
• Feeding problem horses.
• What extras should be included in the diet?
• What’s new in feeding competition and race horses for performance.

The Bayer Lecture Series will be presented at 4 venues:

• Saturday, 13 July
  NZB complex, Karaka, Auckland
• Sunday, 14 July
  Matamata Club, Matamata
• Wednesday, 17 July
  Awapuni Racecourse, Palmerston North
• Saturday, 20 July,
  Riccarton Park, Christchurch

Registration will be from 1.00pm with the lectures starting at 1.30pm and ending at 5.00pm.

BOOK REVIEW:
“Feeding horses in New Zealand” by Erica Gee

“Feeding Horses in New Zealand” is a ‘must read’ for all New Zealand horse owners. Commissioned by the New Zealand Equine Research Foundation and written by Dr Erica Gee, this book covers all aspects of equine nutrition and the types of foods required for individual horses to optimise their health, well-being and performance. From broodmares to race horses, foals and weanlings to the ‘older’ horses, pleasure and performance horses, the underweight to the overweight; every type of horse and its nutritional requirements are covered in this booklet in a clear and concise manner.

Erica is well qualified to write this book, holding a BVSc, PhD, and Dip ACT, and is currently a senior lecturer at the Massey University Institute of Veterinary and Biomedical Sciences. She has a thorough understanding of equine anatomy and physiology and has written an excellent first chapter on the horse’s digestive system and condition scoring, followed by much information on feed types, dietary management of horses and problems related to feeding, before concluding with an outline of poisonous plants in NZ and their effects on the horse.

The NZERF is also delighted that Erica has agreed to be this year’s key-note speaker at the Bayer Lecture Series. Proceedings of her lecture, as well as this booklet, will be available to those attending the lectures. The booklet is also available by emailing the NZERF: nzerf@xtra.co.nz or by phoning the Manawatu Racing Centre: 06 3564940.

Review by Barbara Harvey, NZ Pony Club nominee on the NZERF Board.

VETERINARIAN-FARRIER SCHOLARSHIPS

Annual scholarships for a veterinarian and a farrier to attend the annual laminitis symposium and/or spend some time with colleagues in the USA are provided by the NZ Equine Research Foundation. The purposes of these scholarships are to:

1. Improve the knowledge and skill of New Zealanders in care and treatment of the horses’ foot.
2. Encourage veterinarians and farriers to work together as a team to overcome problems of the horses’ foot.

Preferably applications should be made jointly by a veterinarian and farrier from the same geographical area.

Applications should be made on the Vet/Farrier Travel Grant forms available from the NZERF Office or from the website: www.nzerf.co.nz. Closing date is 30 April, 2013.
The disease strangles, which is caused by infection of horses with a bacterium called *Streptococcus equi* subsp. *equi* (*S. equi*), is one of the most frequently diagnosed, contagious disease of horses worldwide. The disease is characterized by abscessation of the lymph nodes in the neck. The surrounding tissue becomes swollen and in very severe cases can “strangle” the airways of affected horses. When the abscesses burst the material from the draining abscess leads to a nasal discharge which is highly infectious and can contaminate pastures, barns and feed troughs. Strangles is further complicated because some infected horses may not totally clear the infection after treatment and can become carriers showing no signs of the disease.

![Distribution of NZ S. equi strains (SeM alleles 99 and 100)](image)

The differential diagnosis of suspected strangles often results in the culture of multiple streptococci, namely *S. equi*, *S. equi* subsp. *zooepidemicus* (*S. zooepidemicus*) and *S. dysgalactiae* subsp. *equisimilis* (*S. equisimilis*). All three streptococci have implications in respiratory disease in horses. A multiplex PCR diagnostic test was developed to distinguish these Streptococcal species by identifying the presence of their DNA in a specimen. Comparison of culture verses PCR showed that the PCR detected approximately 30% additional *S. equi* infections. The multiplex PCR had a diagnostic accuracy on field specimens of 100% for *S. equi* and *S. zooepidemicus* and 99.3% for *S. equisimilis*. These results are suggestive of a promising molecular diagnostic test for the rapid identification and differentiation of *S. equi*, *S. zooepidemicus* and *S. equisimilis*.

Currently there are 128 recorded strains of *S. equi* throughout the world. This strain discrimination is based on differences in the DNA sequence of the *S. equi* SeM gene. Sequencing of the SeM gene allows identification of current circulating *S. equi* strains and will aid in the recognition of newly emerging strains of *S. equi*. We identified two novel strains of *S. equi* in New Zealand (SeM allele 99 and 100). SeM Allele 100 had a higher prevalence rate then SeM Allele 99, appearing on both islands of New Zealand. SeM allele 99 only appeared on the North Island. The dominance of SeM allele 100 needs to be further accessed with more isolates.

On completion of this work Olivia has received her MSc with first class honours and has been invited as one of forty international participants to the Havemeyer Workshop entitled “Getting to Grips with Strangles and other Streptococcal Diseases 2012” which preceeds the 9th International Conference on Equine Infectious Diseases in Kentucky, USA.
Applications, which close this year on the 30th of October 2009, are to be made on the “Waikato Stud Young career in the equine industry. Applications will be accepted from, but not necessarily limited to, the following:

It is intended that this annual award of $15000 be used to assist an individual under the age of 35 years in their future career in the field of equine science.

We are pleased to announce that we are again seeking applications for this prestigious award. We were delighted with the previous winners, who demonstrated outstanding potential in the equine industry. The winner receives $15,000 to assist in their career development.

For diagnosis testing, nasopharyngeal lavages or swabs should be used as primary screening with real-time PCR for detection. Real-time PCR was shown to be better than conventional PCR and both types of PCR having significantly better sensitivity than culture. Also nasopharyngeal washings had superior sensitivity to that of nasal swabs although more laborious to collect. It was also revealed that the standard use of 3 consecutive PCR-negative samples, used to declare freedom of strangles, is flawed. It was shown that 10 out of 12 horses would have been freed based on nasal swabs and 2 out of 12 on nasopharyngeal lavage samples when they still carried S. equi in their guttural pouch.

The performance of a new multicomponent recombinant vaccine, Strangvac, was discussed. This vaccine is based on the fusion of three proteins derived from S. equi surface localised adherence and secreted proteins that infer an immune response. So far it has shown encouraging results to become a commercial vaccine with no adverse reactions and a good immune response. Further clinical trials are on-going in preparation for its registration.
**Dame Wendy Pye, a New Year Honour richly deserved**

Long time supporter and sponsor of the NZ Equine Research Foundation, Wendy Pye was made a Dame Companion of the New Zealand Order of Merit for services to business and education in the 2013 New Year Honours. “The Foundation is thrilled and delighted that one its longest and most generous supporters has been recognised in this way” commented NZERF Chair Margaret Evans.

Dame Wendy Pye is well known for the publishing business she established, which has helped to teach English to children in many countries. Digital advances have not deterred the company, which has been a pioneer in using technology to teach English, allowing it to expand into huge overseas markets. A seasoned international traveller she has been a long time crusader for children’s literacy in a number of countries.

Together with her husband Don, the Pyes are keen horse owners and breeders. “Cyclades”, the winner of 9 races, holds special memories for them. After being runner up in the Auckland Cup the Cydne Evans-trained gelding triumphed in the 2002 Wellington Cup under the urgings of Lance O’Sullivan. In more recent times Matamata Cup winner Atom Cat has been a consistent performer for them.

The NZ Equine Research Foundation has received generous financial support over many years from the Pye Foundation including sponsorship of the Farrier Scholarship and Vet/Farrier travel programme. In addition Wendy initiated and supported the NZERF Commissioned Research into the “economic impact of the Horse Industry” which was widely used by the racing industry in its deliberations with Government.

**A comparison of equine Adipose Derived Stem Cells (ADSC), Bone Marrow Stem Cells (BMSC) and Peripheral Blood Stem Cells (pBSC) for the treatment of lameness conditions in horses.**

Amy Redmond Hubbard and Dr Lee Morris, EquiBreed NZ Ltd. www.equibreed.co.nz

The high incidence of lameness in horses during training is a major concern within the racing and performance industries. Tendon injuries are a common occurrence and result in the formation of scar tissue within the tendon. This weaker tissue makes re-injury more likely once the horse goes back into training. An Australian study on wastage in two year-old racehorses showed that 66% of lost training days were due to limb injury or lameness. A study in the UK of 400 horses with tendon or ligament injuries showed a re-injury rate of 53% after the horses went back into training. A treatment which can reduce recovery time and get the animal back into work sooner with a lower risk of re-injury would be of great benefit to owners, trainers and horses alike.

The use of mesenchymal stem cells (MSC) can potentially help with reducing the time it takes for an injured horse to get back into work or training. Also, horses treated with MSC have shown a lower rate of re-injury after returning to work. Equine bone marrow, fat tissue and blood can all provide stem cells. This project will test all three sources to see which area of the body provides the best source of MSCs. Ideally the source will be easy to collect from and provide a high number of stem cells. There have been a number of previous studies using MSCs from bone marrow for tendon injuries and how they respond to treatment. In many cases the injured tendons showed improved healing rates with a higher number of treated horses returning to work than untreated horses. MSCs from fat tissue and blood have also shown to improve healing of tendon injuries. Blood as a stem cell source is of particular interest as it is less invasive to collect from the horse than bone marrow or fat tissue, both of which involve minor surgical procedures.

Current MSC treatments take the cells from the injured horse, rather than a donor horse, and inject the cells back into the injured horse. If cells are injected from a donor horse an immune response is stimulated and this results in the cells being rejected. Studies have shown that freezing MSCs can lower the activation of the immune response to the injected cells and reduce rejection rates. All three sources of cells will be frozen to investigate the effect freezing has on the amount of antigen released.

This project provides the opportunity to determine which is the best source of MSCs as well as looking at the effect freezing has on the cells. The ultimate aim is to produce a supply of storable MSC treatments from a group of donor horses which can then be injected into the injury sites of different horses as required. This type of treatment would provide benefits to the equine industry by enhancing the welfare of horses and reducing costs associated with injury and rehabilitation for owners and trainers.
Research, Seminars and Awards

The NZ Equine Research Foundation’s key activities are to encourage and support research and education and this issue of the Bulletin contains the calls for research grant applications, including the newly established Professor Irvine Memorial Award, the veterinarian/farrier scholarship, and the Valachi Downs Young Achiever Award. It also contains information on the International Symposium on Equine Reproduction to be held in New Zealand in January 2014, and the invitation to everyone interested in horse breeding to attend a satellite Breeders Seminar on 29-30 June, 2013.

In the winter the NZERF will again present the Bayer Lecture Series, and this year Dr Erica Gee of Massey University will deliver the very latest information on feeding horses under New Zealand conditions. We encourage you to attend these lectures which will build on the information provided in the latest NZERF publication “Feeding Horses in New Zealand” written by Dr Gee. We are grateful to Bayer Animal Health for their sponsorship of the lecture series.

People and Achievements

On behalf of the NZERF I welcome Mr Martin Saunders as a new Board member, representing the NZ Racing Board, replacing Mr Bill Colgan.

We congratulate Dame Wendy Pye, a long-time supporter of the NZERF, on her New Year’s Honour for services to literature and education.

We extend a welcome to New Zealand to Professor Chris Riley, recently appointed to Massey University as Professor of Equine Clinical Studies. He brings considerable expertise to equine research in New Zealand and we look forward to hearing of his work in the future.

We acknowledge the contributions of Mr Connel McLaren, who together with Mr Don McLaren of Bomac Laboratories have been generous sponsors of the NZERF for many years, and wish him well as he moves from Bayer Animal Health at the completion of the transition period arising from the merger of the two firms.

My thanks to all our Board members who have contributed in various ways to the NZERF achieving its aims in supporting research and education in New Zealand. Please contact your Board representative (contact details on back page) or the office if you have any questions or suggestions.

Margaret J Evans
Chair, NZERF

Research Grant Applications

The NZERF invites applications from interested parties for funding of projects in the field of Equine Research. Applications are to be made on the Research Grant application forms available from the NZERF Office or from the website: www.nzerf.co.nz. Research Grant applications close 30 April, 2013.

Professor Cliff Irvine Memorial Scholarship

Professor Irvine was a founding member of the NZ Equine Research Foundation, and its Vice Chairman at the time of his retirement from the Board. Prof Irvine had a distinguished career in veterinary science, initially as a veterinarian in Southland, and later as a world renowned scientist while working at Lincoln College, specializing in thyroid and reproductive function in horses. He also served as veterinary consultant to the Harness and Thoroughbred Racing codes in New Zealand for many years, and throughout his career he remained accessible to veterinarians for advice and information. These contributions to veterinary science were recognised by the receipt of many awards, including a Doctor of Science from Massey University, a Doctorate of Veterinary Science from Sydney University, its highest award, the Bledisloe Medal from Lincoln University and The New Zealand Order of Merit for Services to Veterinary Science in 2000. The NZERF Board is extremely pleased to be able to offer the Professor Cliff Irvine Memorial Scholarship in recognition and appreciation of Prof Irvine’s enthusiasm and work on the Board and his scientific achievements.

The Scholarship will be awarded to an applicant for a Research Grant and may be used as part of a larger research project or as a stand-alone award. Applications should be made on the Research Grant application forms available from the NZERF Office or from the website: www.nzerf.co.nz. Closing date is 30 April, 2013.

Parties interested in contributing to the Professor Cliff Irvine Memorial Scholarship Fund should contact the NZERF Office.
NZERF Contact Information

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Harness Racing New Zealand (Harness Racing Weekly)
The NZ Standardbred Breeders’ Association (Newsletter)
Equestrian Sport New Zealand (ESNZ Bulletin)
The NZ Equine Veterinary Association (Equine Veterinary Practitioner)
NZ Farriers Association (Inc) (N.Z.F.A. Newsletter)
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The Morgan Horse Association of NZ Inc. (Newsletter)
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