

Australian  
**Equine Science**  
Symposium



Proceedings of the  
**AUSTRALIAN EQUINE SCIENCE SYMPOSIUM**  
Volume 1  
2006

## Sponsors of the 2006

### AUSTRALIAN EQUINE SCIENCE SYMPOSIUM



**Australian Government**

**Rural Industries Research and  
Development Corporation**



**International  
Animal Health Products**  
THE AUSTRALIAN COMPANY



**HUNTER VALLEY EQUINE  
RESEARCH CENTRE**



**THE UNIVERSITY  
OF QUEENSLAND**



**THE AUSTRALIAN  
EQUINE GENETICS  
RESEARCH CENTRE**  
UNIVERSITY OF QUEENSLAND

*"Together ensuring the  
integrity of the Australian  
thoroughbred breeding industry."*

# **AUSTRALIAN EQUINE SCIENCE SYMPOSIUM**

**GOLD COAST, QLD**

**13-14 June 2006**

## **Symposium Committee**

**Professor Wayne Bryden (Chair)**

**Professor Tom Broad**

**Dr Judy Cawdell-Smith**

**Professor Elwyn Firth**

**Dr John Freestone**

**Dr James Gilkerson**

**Professor David Hodgson**

**Dr Peter Huntington**

**Dr Bill Howey**

**Professor Leo Jeffcott**

**Dr Guy Lester**

**Ms Elizabeth Owens**

**Professor Nigel Perkins**

**Professor Martin Sillence**

**Dr Alan Stenhouse**

## **EQUINE SCIENCE 2006**

### **“Research for the 21<sup>st</sup> Century Horse Industry: From Genomics to the Winning Post”**

The inaugural Australian Equine Science Symposium arose from discussions that were held at the Magic Millions Thoroughbred sales in January 2006. Following initial support from RIRDC, a committee was formed and **Equine Science 2006** planned.

The Committee hopes that the Symposium will become a biennial conference for equine scientists which:

- Promotes excellence in equine science
- Focuses on science, technology and innovation relevant to the Australian horse industry
- Provides a regular forum for exchange of research findings, ideas and information between Australian & New Zealand equine scientists and with their international colleagues
- Assists young equine scientists with their careers
- Encourages participation by members of the horse industry

### **Proceedings**

Papers presented at this Symposium have been reviewed to meet editorial standards. However, the comments and views expressed in the papers are entirely the responsibility of the author or authors concerned.

Enquiries regarding the Proceedings should be addressed to:

Professor W.L. Bryden  
School of Animal Studies  
University of Queensland  
Gatton Qld 4343

Tel: (07) 5460 1257  
Email: [hos@sas.uq.edu.au](mailto:hos@sas.uq.edu.au)

## CONTENTS

### INVITED PAPERS

EPIDEMIOLOGY OF MUSCULOSKELETAL INJURIES IN THOROUGHBRED RACEHORSES <i>N. Cogger, N.R. Perkins, D.R. Hodgson, S.W. Reid and D.L. Evans</i>	1
BIOMECHANICS OF THE EQUINE BACK AND SACROILIAC JOINT <i>L. Goff, N.C. Stubbs, J. Jasiewicz and C.M. McGowan</i>	2
EQUINE LAMINITIS <i>C.C. Pollitt</i>	3
SEQUENCING THE HORSE GENOME: DEVELOPMENTS, PROJECTED OUTCOMES AND BENEFITS <i>H.W. Raadsma, N.A. Ellis and I. Tammen</i>	4
USE OF MOLECULAR TECHNOLOGY TO PRODUCE NEW VACCINES FOR OLD DISEASES <i>C.A. Hartley, W.J. Scanlan, S.J. Symes and J.R. Gilkerson</i>	5
HOOF-PRINTS IN THE SAND: THE POTENTIAL OF FORENSIC DNA FINGERPRINTING IN THE EQUINE INDUSTRY <i>A.E.O. Trezise, A.J. Cawdell-Smith, T. Rice, R.L. Smith, P.M. Binks, F.E. Hamilton and T.E. Broad</i>	6
IMPACT OF NUTRITION AND FEEDING PRACTICES ON EQUINE HEALTH, BEHAVIOUR AND WELFARE. <i>P.A. Harris</i>	7
BODY WEIGHT AND GROWTH RATES IN AUSTRALIAN THOROUGHBREDS COMPARED WITH THOROUGHBREDS IN KENTUCKY, ENGLAND, NEW ZEALAND AND INDIA <i>C.G. Brown-Douglas, J.D. Pagan, P.J. Huntington and G. Jenkinson</i>	8
GROWTH AND DISTAL METACARPAL/METATARSAL CONTOUR CHANGES OF PASTURE-FED THOROUGHBRED FOALS <i>E.K. Gee and E.C. Firth</i>	9
INFLAMMATORY AIRWAY DISEASE IN RACEHORSES – WHAT DO WE KNOW? <i>J. L. Hodgson, P.J. Spendlove, N. Malikides, R.M. Christley and D.R. Hodgson</i>	10

### CONTRIBUTED PAPERS

INCIDENCE OF AND RISK FACTORS FOR MUSCULOSKELETAL INJURY IN NEW ZEALAND THOROUGHBREDS <i>N.R. Perkins</i>	11
ASSESSMENT OF FITNESS IN THOROUGHBRED RACEHORSES WITH ON-BOARD MONITORS OF HEART RATE AND VELOCITY <i>D.L. Evans, H.L. Gramkow, A.D. Vermeulen</i>	12
EQUINE AMNIONITIS AND FOETAL LOSS (EAFL) IDENTIFIED AS A CAUSE OF PREGANCY LOSS IN AUSTRALIAN MARES <i>N.R. Perkins, K.H. Todhunter, R.M. Wylie, A.P. Begg, J.R. Gilkerson, G. Muscatello, D.J. Racklyeft, C. Chicken, M.C. Wilson and A.J. Cawdell-Smith</i>	13

BODY WEIGHT AND CONDITION OF KENTUCKY THOROUGHBRED MARES AND THEIR FOALS AS INFLUENCED BY MONTH OF FOALING AND SEASON <i>C.G. Brown-Douglas, J.D. Pagan and S. Caddel</i>	14
FIRST AUSTRALIAN BIRTH OF FOALS FROM ARTIFICIAL INSEMINATION OF SEX-SORTED AND NON-SORTED FROZEN STALLION SPERMATOZOA <i>J.R. Clulow, G. Evans, W.M.C. Maxwell, J.A. Rodgers, A.J. Cawdell-Smith, H. Sieme, D. Rath and L.H.A. Morris</i>	15
HEART RATE SYNCHRONISATION OF DRESSAGE HORSE AND RIDER DURING WARM UP PERIOD FOR A COMPETITION DRESSAGE TEST <i>D.J. Bridgeman, G.M. Pretty and A. Tribe</i>	16
EFFECT OF ORAL TRYPTOPHAN ON THE REACTION OF HORSES TO A NOVEL PERSON OR OBJECT <i>G.K. Noble, Y.M. Brockwell, K.J. Munn, P.A. Harris, H.P.B. Davidson, X. Li, D. Zhang, M. Cao, W.L. Bryden and M.N. Sillence</i>	17
QUANTIFYING NIGHT VISION IN HORSES <i>M.M. Holly, M.A. Hohenhaus and M.N. Sillence</i>	18
APPLICATION OF BLOOD GENE EXPRESSION PROFILING TO MONITORING EQUINE HEALTH AND PERFORMANCE <i>R.B. Brandon and M.R. Thomas</i>	19
CHARACTERISATION OF THE EQUINE ACE GENE <i>N.A. Ellis, I. Tammen, A.J. Forhead, P. Thomson and H.W. Raadsma</i>	20
WHAT NOBODY EVER TELLS YOU ABOUT EQUINE ANTHELMINTICS <i>C. Lawlor</i>	21
THE EFFECT OF EQUINE HYPERIMMUNE SERA ON TNF $\alpha$ ACTIVITY IN A L929 CELL BIOASSAY <i>M. Kotiw, C. Raghaven, M. Johnson, I.A. Shiels and R.P. Wilson</i>	22
COMPARATIVE EFFICACY OF AEROSOL THERAPIES FOR THE REDUCTION OF PULMONARY NEUTROPHILIA ASSOCIATED WITH INFLAMMATORY AIRWAY DISEASE (IAD) IN HORSES <i>P.J. Spendlove, J.L. Hodgson, D.R. Hodgson</i>	24
EFFECT OF DIETARY FAT TYPE ON MUSCLE GLYCOGEN IN HORSES <i>A. Grimmett</i>	25
GLUCOSE UPTAKE IN THE EQUINE HOOF <i>K.E. Asplin, C.M. McGowan, C.C. Pollitt, J. Curlewis and M.N. Sillence</i>	26
THE INFLUENCE OF BODY WEIGHT, WITHER HEIGHT AND BODY CONDITION SCORE ON SALE PRICE OF THOROUGHBRED YEARLINGS AT PUBLIC AUCTION <i>J.D. Pagan, D.M. Nash, A. Koch, S. Caddel and C.G. Brown-Douglas</i>	27
PROBIOTICS, INTESTINAL HEALTH AND PERFORMANCE – FACT or FICTION <i>J. Chin</i>	28
THE BACTERIAL COMMUNITY OF THE EQUINE GASTROINTESTINAL TRACT <i>R. Al Jassim</i>	29
THE EFFECT OF DIETARY TRANSITION ON FAECAL pH AND MICROBIOLOGY OF THOROUGHBRED HORSES <i>M. Van Den Berg, S.O. Hoskin, C.W. Rogers, A. Grinberg and N.D. Walker</i>	30

FLUORESCENCE <i>IN SITU</i> HYBRIDISATION STUDIES OF EQUINE HINDGUT BACTERIAL POPULATIONS DURING THE ONSET OF EQUINE LAMINITIS. <i>G.J. Milinovich, D.J. Trott, P.C. Burrell, and C.C. Pollitt</i>	31
THE USE OF A NUTRACEUTICAL GROWTH PROMOTER WITH WEANLING HORSES. <i>C.W. Rogers and E.C. Firth</i>	32
GRAIN PROCESSING: THE DOUBLE EDGED SWORD <i>N. Richards</i>	33
FACTORS THAT AFFECT THE RATE OF INTAKE WHEN HORSES ARE FED A CONCENTRATE DIET <i>T.E. Campbell, P.A. Harris, H.C. Doughty and M.N. Sillence</i>	34
FORM AND SOURCE OF TOCOPHEROL AFFECTS VITAMIN E STATUS IN HORSES <i>J.D. Pagan, E. Kane, D. Nash and P.J. Huntington</i>	35
NUTRITIONAL STATUS OF ELITE OLYMPIC EQUINE ATHLETES <i>E.A. Owens</i>	37
EXPOSURE OF HORSES TO TOTAL AND RESPIRABLE PARTICLE ENDOTOXIN CONCENTRATIONS GENERATED BY SPECIFIC FEED AND BEDDING MATERIALS <i>P.J. Spendlove, J.L. Hodgson, D.R. Hodgson and N. Malikides</i>	38
DEVELOPING NEW DIAGNOSTIC TESTS FOR EQUINE INFECTIOUS DISEASES <i>J.R. Gilkerson, C.A. Hartley, G. Muscatello and G.F. Browning</i>	39
REVISING OUR UNDERSTANDING OF THE EPIDEMIOLOGY AND ECOLOGY OF <i>RHODOCOCCUS EQUI</i> PNEUMONIA – DEVISING NEW APPROACHES FOR CONTROL <i>G. Muscatello, J.R. Gilkerson and G.F. Browning</i>	40
USING DNA SEQUENCING TO DIAGNOSE UNUSUAL PATHOGENS <i>G. Muscatello, E. Stella, P. Markham, K.L. McBride, M.L. Flash, J.R. Gilkerson and G.F. Browning</i>	41
ENZYMATIC PROTECTION AGAINST CEREAL GRAIN INTOLERANCE AND MICROBIAL INFECTION <i>C.J. Hawkins and J.H. Stewart</i>	42
EFFECT OF TRANSPORT AND SEPARATION FROM FOAL ON MARE FERTILITY AT FIRST POST-FOALING SERVICE <i>K.M. Burey, A.J. Cawdell-Smith and N.R. Perkins</i>	43
OLFACTORY BEHAVIOUR OF STALLIONS EXPOSED TO MARES URINE <i>K.M. Burey and A.J. Cawdell-Smith</i>	44
CREATING AN INTEGRATED MAP OF THE HORSE GENOME USING LINEAR INTERPOLATION <i>K. Castle, F.W. Nicholas, L.B. Jeffcott, D.R. Hodgson, I. Tammen and H.W. Raadsma</i>	45
SUSPECTED CASES OF EQUINE PASPALUM STAGGERS <i>A.J. Cawdell-Smith and C.J. Scrivener</i>	46
A DISCRIPTIVE STUDY OF THE STERNAL AND LATERAL RECUMBENCY BEHAVIOUR OF TWO SHOW HORSES DURING TRANSPORTATION TO DIFFERENT ENVIRONMENTS <i>D.J. Bridgeman and M.A. Hohenhaus</i>	47

A COMPARISON OF GLUCOSE - INSULIN REGULATION IN THOROUGHBREDS AND AUSTRALIAN STOCKHORSES <i>T.N. Dobbs, C.M. McGowan, R.C. Boston and W.L. Bryden</i>	48
NUTRITIONAL EVALUATION OF THE FEEDING REGIMENS USED BY AUSTRALIAN THOROUGHBRED RACEHORSE TRAINERS <i>C.E. Foote</i>	49
EFFECTS OF EQUINE SOMATOTROPHAN AND TRAINING ON FEED INTAKE AND BODY COMPOSITION OF STANDARD BRED YEARLINGS. <i>M.P. Gerrard, D.R. Hodgson, X. Li, R.J. Rose and W.L. Bryden</i>	50
HEART RATE RESPONSE OF RESTRAINED DOMESTICATED HORSES TO POTENTIAL FERAL HORSE REPELLENTS <i>S.D. Joseph, L.K.P. Leung and D.McK. Berman</i>	51
MAGNETIC RESONANCE MICROSCOPY OF THE EQUINE HOOF WALL <i>M.D. Keller and C.C. Pollitt</i>	52
OWNER PERCEPTIONS OF HEALTH AND WELFARE ISSUES IN HORSES AGED 15 YRS OR OLDER <i>T.M. McGowan, N.R. Perkins, G. Pinchbeck, M.A. Hohenhaus, D.R. Hodgson, G.P. Pearce, C.M. McGowan and D. Mellor</i>	53
SCREENING FOR METABOLITES OF CHLORPHENIRAMINE AND TRIPELENNAMINE IN HORSE URINE. <i>S. Nelis</i>	54
THE ANALYSIS OF PROMETHAZINE AND ITS METABOLITES IN EQUINE AND CANINE URINE. <i>S. Nelis and C. Sievers</i>	55
GRAIN FEEDING PRACTICES AND THEIR EFFECT ON HINDGUT HEALTH IN RACING THOROUGHBREDS <i>N. Richards</i>	56
DETECTION OF AEROSOLISED IPRATROPIUM BROMIDE (ATROVENT®) IN EQUINE URINE POST ADMINISTRATION USING LIQUID CHROMATOGRAPHY MASS SPECTROSCOPY <i>P.J. Spendlove, N. Basgallop, J.L. Hodgson and D.R. Hodgson</i>	57
EQUINE WATER KINETICS AS INFLUENCED BY AGE AND TEMPERAMENT <i>K. Van der Aa Kuhle, A.J. Cawdell-Smith, W.L. Bryden, P.S.W. Davies and G.McL. Dryden</i>	58
APPLICATION OF BIOIMPEDANCE FOR THE DETERMINATION OF EQUINE BODY COMPOSITION <i>K. Van der Aa Kuhle, P. Johnson, K.E. Andrews, A.J. Cawdell-Smith, W.L. Bryden and L.C. Ward</i>	59
AMINO ACID ANALYSIS OF HORSE SERUM BY A NEW GAS CHROMATOGRAPHY METHOD <i>D. Zhang, X. Li, K.J. Munn, M.N. Sillence and W.L. Bryden</i>	60
AUTHOR INDEX	61