

INVITATION PUBLIC DEFENCE
THERMOREGULATION IN EXERCISING HORSES

LIDWIEN-ELISABETH VERDEGAAL
13th July 2022

PROMOTORS

Prof. dr. C. Delesalle
Faculty of Veterinary Medicine
Ghent University, Belgium
Prof. G. Howarth
Dr T. McWhorter
School of Animal and Veterinary
Science, Adelaide University,
Australia

Curriculum Vitae

Lidwien-Elisabeth Verdegaal obtained her Bachelor of Veterinary Medicine (MVM) in 1993 and obtained her Masters of Veterinary Medicine at Utrecht University, The Netherlands, in 1996. Once qualified, she worked in a mixed practice in the Southern part of the Netherlands (Diessen) for two years before returning to Utrecht University to specialize in Equine Internal Medicine. Lidwien completed her residency in Equine Internal Medicine at Utrecht University's Faculty of Veterinary Sciences. She qualified as an Equine Medicine Specialist with the Royal Dutch Association of Veterinary Specialists and is a Diplomate of the European College of Equine Internal Medicine (ECEIM) accredited by passing the ECEIM Board exam in 2009.

Lidwien's focus on equine medicine led to 8 years of valuable experience as an Equine Medicine Specialist in private clinics working for the Jordanian Royal Family as well as establishing and working at a new equine referral hospital in Kuwait. She was a member of endurance and jumping FEI committees in Jordan and Kuwait where she developed her deep ongoing interest in thermoregulation and heat stress.

Since 2011, Lidwien has held tenure as a Senior Lecturer in Equine Medicine with the University of Adelaide's School of Animal and Veterinary Science in South Australia. She has contributed significantly to the development of the new veterinary medicine School at the University of Adelaide. She was part of endurance and jumping FEI veterinary committees and also an official FEI endurance and eventing competition veterinarian in Australia. Her lectures and clinic sessions are noted for her passion for her subject and enthusiasm in encouraging the next generation of veterinarians. As a firm believer in a healthy work-life balance, she ensures having quality time for family, friends, and the occasional gallop.

With over 25 years of experience to draw on, Lidwien Verdegaal is dedicated to performing high quality research and improving the welfare of all sport horses. Her current PhD research is the first joint-PhD agreement between the Ghent and Adelaide University, supervised by Prof. Catherine Delesalle of the Research group of Comparative Physiology, and Prof. Gordon Howarth and Dr. Todd McWhorter, both from the School of Animal & Veterinary Sciences at the University of Adelaide. The PhD research focuses on thermoregulation and metabolic disorders and is likely to have a worldwide

impact on how heat stress is managed in real-life equine sport and racing conditions. This research work is the blueprint for further cooperation with the Research Group of Comparative Physiology of Prof. Delesalle.

Lidwien Verdegaal is the author of 13 peer reviewed publications of which 10 as first author. She was invited speaker at 18 conferences.

Where?

The defence will take place on
Wednesday 13th July 2022 at 5 PM

Auditorium A

Faculty of Veterinary Medicine
Ghent University, Campus Merelbeke
Salisburylaan 133, Merelbeke

Small drinks and bites will be offered following the defence.

How to attend?

If you would like to attend, please register before 12th of July, by email to
Lidwien.Verdegaal@adelaide.edu.au

Members of the Jury

Prof. dr. Dominiek Maes
Chair, Deputy of the Dean, Faculty of Veterinary
Medicine, Ghent University

Prof. dr. Ward De Spiegelaere,
Faculty of Veterinary Medicine, Ghent University

Dr. Hugo Boeykens,
Veterinary Clinic Kerckenbosch, Belgium

Prof. dr. Pieter Cornillie
Secretary, Faculty of Veterinary Medicine, Ghent
University

Prof. dr. René van den Hoven
Faculty of Veterinary Medicine, Vienna, Austria

Summary thesis

Hyperthermia is an ongoing welfare and performance issue for all horses exercising in racing and other competitive sport events. At present, little is known about the influence of core body temperature evolvment on hyperthermia in real time during different types of exercise performed in field conditions such as racing and endurance events. Consequently, it is becoming increasingly important to establish appropriate policies regarding the detection and prevention of all types of heat stress. To achieve this, a detailed view of the variability of equine thermoregulation during field exercise and recovery is essential.

To date, the vast majority of thermoregulatory studies have been conducted in indoor laboratory conditions using a treadmill and subjecting horses to specific standardized exercise tests. However, this approach cannot successfully reflect real-time field conditions. Hence, there is a need to accurately and reliably monitor equine core body temperature responses to avoid potential harm due to increasing heat load.

Chapter 3 describes a study designed to evaluate the efficacy of continuous monitoring of core body temperature using the novel telemetric GI pill during real-time field exercise for the first time. The results showed that the continuous recording of the GI core temperature in exercising horses in the field using the GI pill was non-invasive, practical and accurate. Temperature fluctuations experienced during exercise and recovery are reliably recorded, and tendencies toward EHI will be easily observed during field exercise. Importantly, the GI pill has proven to be a more accurate and precise tool to monitor core thermal response when compared with serial Tre measurements in the field

Chapter 4 describes the application of this novel thermoregulation monitoring method in detail. The study involved measurements conducted in both endurance horses and trotters in order to compare exercise types in real-life competitions in the field. Not only were the core body temperatures (Tc) continuously monitored during exercise and recovery, the thermoregulatory responses to the different exercise intensities were also compared. The findings of this study reported real-time temperature evolvment during real-life competition in the field. More specifically, endurance horses reached peak temperature at 75% of completion of 40 km of exercise. However, trotters reached peak temperature always during recovery. In addition, the Tc in endurance horses returned to baseline within 60 minutes into recovery while in 30% of trotters, Tc was still higher than 39°C at the end of recovery.

Overall, the study showed that horses have very individual thermoregulatory responses which require highly accurate monitoring no matter what type of exercise is performed in the field.

Chapter 5 investigated the usefulness of monitoring skin temperature in endurance horses. A large array of skin temperature methodologies recently used in the field is reviewed, mainly pre- and post-exercise at time points,

In this study, to evaluate if skin temperature could be used as a proxy for core temperature, the skin temperature was continuously monitored and evaluated using an infrared monitor during a real-life endurance competition. The skin temperature was compared to the GI temperature and importantly, there was no correlation between skin and GI temperature.

The thesis contains additional pilot studies, of which analysis and data-output are still ongoing. Those studies are added as appendences.