



Top End research backs our gold medal push

Research by sports scientist Matthew Brearley is helping Australia's elite athletes reach their potential under extreme conditions.

TEXT

Richie Hodgson

PHOTOGRAPH

Courtesy Football Federation Australia

ABOVE

Dr Matthew Brearley undertakes hydration testing with the Olyroos in June 2008.

Northern Territory sports scientist, Dr Matthew Brearley's research into athletic performance in the tropics is proving invaluable to Australia's premier and Olympic athletes.

Australia's obsession with gold medals, world records and sporting glory means our athletes are continually pushing themselves to their limits like never before. And with Darwin's extreme conditions attracting some of the world's finest athletes, it's game on!

A true love of sport and a burning desire to help Australian athletes push the boundaries of performance inspired Dr Brearley to undertake a PhD at CDU, which was awarded recently. He investigated thermal physiology, an area of national sporting interest, and continues to advise the Australian Olympic Committee regarding heat-related issues.

As the National Heat Training and Acclimatisation Centre's performance-enhancement services manager, Dr Brearley travelled to Beijing in August 2007 to implement a series of monitoring and cooling strategies with the Australian men's and women's hockey teams as a part of an Olympic test event.

“For our Olympic athletes to be a force in Beijing, the challenge was always that they needed to be able to perform at their best in difficult conditions,” he said.

With August temperatures in Beijing generally above the 30 degree mark and humidity around 50 per cent, the combination of factors equates to a heat stress index above 100 per cent. In these conditions, an athlete's sweat is not enough to control their body temperature.

Dr Brearley's latest research is one of the most comprehensive studies of athletes' responses to high-intensity activity in tropical conditions and the development of pre-cooling procedures.

By identifying the physiological and perceptual strain endured by athletes competing in hot conditions, and developing cooling strategies, Dr Brearley's research sought to maximise athletic performance in some of the most trying conditions. These studies were the first to use NASA-developed ingestible core temperature sensors to assess the responses of athletes competing in the tropics.

The findings from the four-year study demonstrated that athletes endured high levels of physiological and perceptual strain when competing in tropical conditions and that pre-cooling in water reduced subsequent strain and might enhance athletic performance.

“In the tropics you don't need much of a warm-up. It doesn't take much to take a body up to temperature because of the environment being so warm,” he said.

During the acclimatisation process, the athlete's internal temperatures climb. They sweat profusely and lose large quantities of salt in their sweat. As the days pass, they sweat even more, their salt loss diminishes, skin and internal temperatures drop and endurance improves.

“There are a couple of aspects to acclimatisation,” Dr Brearley said. “There's the physiological and then there's more of a psychological, I guess you could say mental, aspect.

“With the physiological, you can confer pretty much all acclimatisation benefits in up to 14 days. During that time they store heat that they wouldn't normally store in their local environment, and that basically switches on sweating and dealing with the entire body temperature.”

After seven days of training, the body is sweating near full capacity. It begins sweating at a lower core temperature and allows an athlete to exercise longer before they begin to overheat. The psychological aspect, the willingness to continue working through intense heat, is more complex and often takes longer to achieve depending on the athlete.

The Darwin born and bred researcher said he believed that as athletes reached the boundaries of individual excellence, the role of sports scientists would evolve and even more emphasis would be placed on getting athletes to go harder and faster for longer.

“Every Australian national team has its own dedicated team of sports scientists and the demand for sports-based scientific knowledge preparation has never been greater.”

Much to his delight, Dr Brearley's research has taken him out of the laboratory and into the field to assess thermal strain on local and visiting athletes in sports such as rugby union, hockey, motorsport, cricket and football. Most recently he conducted a series of hydration test events with the Australian under-23 national soccer team during a trip to Darwin in June 2008.

Dr Brearley pointed to his love of all sports and the challenge to gain a scientific understanding of what an athlete experiences in competition as the motivations underpinning his work.

“Ideally, we can develop practical and individualised method-based strategies that maximise athletic performance in a variety of conditions. The nature of my work means that I'm very much behind the scenes but the end result is the most important thing. Knowing that I may have in some small way contributed to an athlete's personal best or world record is satisfaction enough for me,” he said.

○



ABOVE LEFT
Dr Brearley puts NTIS athlete Jack Benson through his paces.

PHOTOGRAPH
Richie Hodgson

ABOVE RIGHT
Darwin's harsh sporting conditions make it a destination of choice for some of the world's best athletes.

PHOTOGRAPH
Courtesy Football Federation Australia

WEB BYTE

For more information on the NT Institute of Sport, visit www.ntis.nt.gov.au.