Athlete sweat studies deliver refreshing results

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Scotland international Ross Ford competing against New Zealand. Credit: Scottish Rugby

A project with Scottish Rugby players by sports scientists from the University of Stirling has highlighted the growing importance of studying sweat.

Sports drink companies invest millions into research at their laboratories to develop the perfect tonic for amateur and professional sports people.

And researchers at Stirling, Scotland's University for Sporting Excellence, have highlighted the importance not just of knowing how much you sweat, but what you sweat.

"When you sweat, your body not only loses fluid, but also electrolytes - salts such as sodium and potassium," said Dr Stuart Galloway, a Stirling Health and Exercise scientist and senior sport lecturer. "The individual variation in salt losses can be large and is influenced by many factors, but in some people salt losses are high.

"Alongside the large individual variations in fluid losses with exercise this means that some athletes require specific strategies to optimise fluid and salt replacement between training sessions and in matches."

Dr Galloway's team considered the individual sweat pattern of the senior Scotland men's rugby team to assist the nutritionists in developing tailored hydration plans for each player.

"The study worked incredibly well on two levels," said Richard Chessor, Lead Nutritionist with Scottish Rugby. "Firstly, it helped me to build up a picture of each player and how they hydrate. It can be difficult to take on fluids during a match as a player might need to wait for a long break in play.

"When they get the chance, one litre of fluid might be not enough for one player and it could be way too much for the next. Knowing the differences of each player meant I could identify who needs to rehydrate more aggressively.

"So it informed us about the volume required and secondly, knowing the

composition of their sweat flagged up the drink formula needed to hydrate them effectively. Ninety percent of the players were within normal boundaries, but four or five guys had either high sodium, high potassium or both. This could have been linked to salt intake, but we found it was actually their normal composition and were able to formulate the appropriate drinks for them."

The procedures were initially developed with players at Stirling County RFC, with players weighed before and after training, monitoring fluid intake and sweat loss.

Small pads were placed on the chest, back, quad and calf during training then analysed afterwards to determine the sweat composition, studying the key electrolytes.

Chessor put the findings into practice for the highly successful 2010 tour of Argentina, when Scotland secured its first ever Test series away win and is now considering other research opportunities with the University.

He added: "It was a nice time to do the tests prior to a tour in a hot climate. I can safely say our sweat loss was high in Argentina and we felt better informed to address it. It's more than just ensuring water in the body; it has an impact on hormones, hunger, appetite and performance."

Dr Galloway's team also conducted a similar analysis of leading tennis players based at the Scottish National Tennis Centre in Stirling and also provided analysis to a wide range of team and individual sports. They recently completed a project exploring the secret to successful training, working with cyclists to discover the correct balance of intense and light exercise to deliver optimum results and aid quicker muscle recovery.

"Research we have been involved in and the work of others is changing practice for sports nutritionists and dieticians", added Dr Galloway.

"They are now much more aware there is a real need for individual assessments of each sports person rather than just following a general guideline."

Provided by University of Stirling