

The Answers a World Record Holder's Urine Provides Cambridge Scientists!

Friday 13th March 2009

Dee Caffari is not only competing in the non-stop, round-the-world yacht race the Vendée Globe but she is also taking part in scientific research with scientists at MRC Human Nutrition Research in Cambridge and all Dee had to do was collect her urine!

Whilst many were enjoying the festive break and the chance to relax, Dee Caffari has relished in taking on the challenge of spending three months at sea in a single-handed, non-stop, round-the-world sailing race – the Vendée Globe. On November 9th, Dee set sail with the aim of securing a world record as the first female to sail solo, non-stop around the world in both directions. To top this task Dee is also working with a team of scientists from Cambridge and Leeds Metropolitan University to determine her energy expenditure during this 28,000-mile pinnacle of offshore sailing.

The scientist's goal is simple: to determine the amount of energy expended during such an arduous challenge, which will see Dee pushed to her physical maximum. Hoisting mainsails, performing sail changes and running repairs have been pushing Dee's body to the limits. Add to this mix a lack of sleep and it becomes vital that Dee is consuming enough calories to meet the demands of the voyage. If Dee does not consume enough calories then her performance suffers and she loses weight, which will result in a loss of both fat and all important muscle. Gaining information on how much energy Dee is using is a vital tool for being able to target her diet to meet her bodies' requirements during such demanding endurance races in the future.

Currently there is little information available on the energy needs of sailing such extreme feats and their different stages. Dee and the scientists are taking advantage of this unique opportunity to gain information of the bodies' energy requirements during such an extreme period of activity, with measurements being taken from two different stages of the race; from the relatively calm waters of the Atlantic Ocean

and from the Southern Ocean, where severe wind and wave conditions have been testing Dee to her absolute limits.

Dee is keen to gain as much information from scientists during this race, saying "This is a chance in a lifetime to collect information on how much energy I am actually using during the race whilst onboard my yacht, *Aviva*, and this will let the team make sure that I am eating not only enough, but also the right types of foods for my races in the future. 'Mother Nature' can be completely unpredictable and definitely challenges you to your maximum and you just can't replicate a race like this in a laboratory."

To gain vital information on how much energy Dee is using, she has been given some special 'Doubly labelled tracer water' by the Cambridge Scientists. So, in addition to all the other challenges and tasks Dee has had to contend with onboard, she has also been collecting and filtering her urine for 5 days in both oceans and storing the samples for the scientists until the race finish. The tracer water is naturally enriched to make it slightly heavier than normal water. This heavy-water mixes with the water that is already in Dee's body and can then be measured in Dee's urine as it disappears over a number of days. This will tell the scientists how much energy Dee has been using during these two periods of the race. This will enable the team at Leeds Metropolitan to target Dee's diet to match the different demands of each stage of the race.

Useful websites:

www.mrc-hnr.cam.ac.uk

www.deecaffari.co.uk

www.avivaoceanracing.com

www.vendeeglobe.org/en/