



Altitude training

An elite athlete's personal experience

Ross Howitt interviews Great Britain's Under-18 double sculler Ed Grisedale about his recent experience of altitude training in Spain

Ed Grisedale is an A-level student, much like any other. The only difference is that Ed has his sights set on a place in Great Britain's rowing team for the 2016 Olympic Games in Rio de Janeiro.

Juggling school work and training commitments can prove problematic, and Ed has recently had to take time out from his studies to attend a high-altitude training camp with the Great Britain Under-23 squad as part of their development for the 2012/13 season.

Training took place at the Sierra Nevada High Altitude Training Centre (CAR) in Spain, which belongs to the

Spanish Ministry of Education and Science's Senior Sports Council. It is 2,320m above sea level and is an ideal place for altitude training, offering outstanding facilities for use by athletes, federations and sporting clubs, both Spanish and foreign.

What is altitude training?

Altitude training — also known as hypoxic training — involves living or training in oxygen-reduced air to improve athletic performance.

Although it is possible to create hypoxic conditions anywhere using an altitude chamber, many athletes favour the traditional method of spending time in hypoxic conditions high above sea level to experience the physiological adaptations that occur.

How it works

When the human body is exposed to hypoxia (oxygen-reduced environments),

it struggles to produce the required amounts of energy with less available oxygen. This struggle triggers the onset of a range of physiological adaptations geared towards enhancing the efficiency of the body's respiratory, cardiovascular and oxygen-utilisation systems.

The lack of oxygen causes some immediate effects, such as an increase in breathing and heart rate in an attempt to increase blood oxygen levels. However, in prolonged training periods at altitude (usually 30 days or more) the body starts to increase its production of red blood cells and increases haemoglobin concentration. Thus the body can carry more oxygen in the bloodstream to compensate for the smaller amount in the atmospheric air.

On returning to sea level, the higher red blood cell count and haemoglobin concentration remain for 6–8 weeks. Since there is more atmospheric oxygen, the body's ability to carry oxygen for energy production increases. This increased ability to transport oxygen benefits endurance athletes, although the process of gaining such benefits at altitude is not easy. Athletes can suffer from altitude sickness, feel lethargic, dehydrated and psychologically drained.

Interview

Ross Howitt asked Ed Grisedale about his training camp experiences at altitude.

RH Can you give us some background on your achievements in rowing to date?

EG In August 2011 we finished sixth in the Double Scull World Junior Rowing Championships, held at Dorney Lake near Windsor. In December 2011 I attended the Under-23 GB trials and did well enough to be invited to a training camp in Spain. Six scullers and 12 rowers were invited in total.

RH Were you fully briefed on the objectives of the camp?

EG Yes. It was explained to us that the camp was seen as training development for the 2012 World Championships. The camp lasted 10 days in total. Although physiological adaptation would be minimal because it was only for 10 days, it was explained to us that it would be really hard and would enable us to make fitness gains.

RH Did you have to do any preparatory work before attending the camp?

EG Before going to the camp we all met at the English Institute for Sport at Bisham Abbey near Marlow. We were given medical examinations and briefed in full about potential problems that we might encounter at the camp — such as dehydration, cramp, insomnia — and how hard it would be to recover. We also had to do a bank of fitness tests to measure our basal sea-level fitness scores.

These tests included rowing 2 × 6,000m at normal aerobic steady state (UT2) with 90 seconds rest in between. We also did some lactate testing, allowing our coaches to find out our 500m split/pace, which resulted in us producing 2mmol of lactate. This was used to work out what intensity we should use when at altitude so that we didn't burn out. In other words, the intensity calculated



Ed Grisedale in action

should be sustainable for hours on end (which is how the training was).

The coaches also told us about the importance of taking supplements prior to the camp. We were asked to take vitamin C to reduce the risk of infection and encouraged to use hyper-hydration drinks and protein and carbohydrate shakes to aid our recovery.

Before we got on the plane we were also told to take First Response, which is a medication used to prevent the onset of coughs and colds. It is a nasal spray that reduces the chance of bacteria building up in the nasal passages.

RH Tell us a bit about the camp.

EG The CAR is an excellent facility and there were a variety of athletes there, particularly swimmers.

RH Can you describe a typical day at the camp?

EG We were woken at 7 a.m. every morning and had our first breakfast, which usually involved cereals and bread.

We always had morning monitoring, which involved urinating in a pot and measuring hydration, perceived sleep amounts and wellbeing scored out of 100. Morning weight and waking heart

rate were also recorded, to make sure that we were recovered and not becoming ill.

After breakfast we had our first training session which involved 12,000m or 18,000m on the ergometer (indoor rowing machine), with a suggested heart rate of approximately 160 beats per minute. Our lactate levels were recorded every 6 kilometres.

After this session we had our second, fully cooked breakfast. We then had a short rest followed by our second training session. This usually involved weight training, particularly muscular endurance work. We did lots of squats, bench press exercises etc. After this session we had another break.

Lunch was always high in carbohydrate, particularly pasta.

After lunch we had a 2-hour break. We then had our third training session of the day, but this was usually a 'fun' session where we played a game like football or handball. However, we were always so tired from the previous sessions that these 'fun' sessions were actually the hardest, as we're all so competitive. After a further hour's break we had our fourth session of the day, which usually entailed weights or ergo' work.

After dinner we tended to have an early night to recuperate for the next day.

RH How did you find the training camp experience overall?

EG Really, really hard. The volume of training was a lot to manage and I don't think I was mentally prepared for just how tough it was going to be. I was surprised by the effect that the lack of oxygen had on me and just how slow my recovery rates were. I relied heavily on my natural stubbornness to keep training and not give in when I felt terrible. My lactate samples were particularly high and my sleeping pattern was poor. I found it hard to fall asleep at night even though I was exhausted. My lactate levels were regularly recorded at 3–3.5mmol and I was told by my coaches on several occasions not to push myself too hard.

I was also surprised and disturbed by other effects I suffered, like nose bleeds and an incredibly dry mouth. The effect that altitude training had on me was relentless. I could feel the pain and fatigue even when I was brushing my teeth. Things that you don't usually classify as exercise, like climbing small flights of stairs or walking to dinner, caused my breathing rate to increase. I was panting at times when I felt I shouldn't be.

Our coaches didn't want people to burn themselves out. Some people couldn't train at all at times. I was told to sit on the bike for 40 minutes at one point, maintaining a low heart rate because my physiological scores were excessive. Many of the guys actually became ill, usually with throat infections or cold-like symptoms. It was a great experience but incredibly hard.

RH It certainly sounds tough. Did you have specialist support with you to monitor you?

EG Yes, there was a doctor present to monitor us. We also had a physiotherapist, a strength and conditioning coach, and our usual rowing coaches. We also had a physiologist who monitored lactate samples and hydration levels.

RH How did you feel when you returned home? Did you feel any benefits of the training camp?

EG I had a 5,000m test 1½ weeks after getting home. I noticed a slight positive change in my performance but I was so tired after the training camp that I feel it took me over 2 weeks to be in a good-enough state to see if it had worked. I must admit I started to notice that the camp had helped for my long distance training and allowed me to 'pull' a better split than I had before.

The whole experience allowed me to complete a focused period of training and definitely helped me to prepare for competition. The full physiological benefits with regard to haemoglobin concentration and red blood cell

count would have been experienced if I had continued to train in Spain for longer.

RH So what's next?

EG I have thought about university and even had contact from Harvard and Yale in the USA about sponsoring me in a scholarship programme. However, I want to dedicate my time to rowing in Great Britain and would love to compete in the 2016 Olympic Games in Brazil.

Useful sites

For further information on altitude training see www.hypoxico.com

Watch Ed Grisedale and Joe Guppy at the junior world rowing championships in 2011: tinyurl.com/c3v717d

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