



EFFECTS OF METABOLIC AND MUSCULAR FATIGUE ON THE CYCLING PERFORMANCE

Ultracycling 3 confini 2017

www.ultracycling3confini.com



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Factors affecting the ultra-endurance performance

The main factors affecting the performance in ultra-endurance events are the maximal oxygen uptake, the fraction of it maintained during the race and the cost of transport. These factors are affected by central (nervous) and peripheral (muscular) aspects.

In the last years, the group of exercise physiology at the University of Udine is studying the above-mentioned parameters, with the goal to suggest new training methodologies to achieve a better performance.

Ultra-endurance project

The objective of the present study is to determine how an ultra-endurance cycling race (**Ultracycling 3 Confini**) affects some physiological parameters. In particular, we would like to better understand how the muscular metabolism (in the quadriceps femoris) is affected by a long lasting cycling race. Before and after the competition we will evaluate some physiological parameters in the athletes who take part in the race. Every test lasts about 20 minutes and will be performed as follow:

During the week before the race in the laboratory of exercise physiology in Udine:

- Questionnaire about the physical activity performed by the subject
- Anthropometrics (weight, stature) and body composition (fat and fat-free mass)
- Incremental test on a modified cycle ergometer that allows extending only the lower limb. The test will start with a low resistance and then it will be increased every minute until the volitional exhaustion. During the test we will collect the oxygen consumption, heart rate, lactate acid and oxygen extraction with NIRS (Near-infrared spectroscopy). The latter is a non-invasive way to measure the tissue oxygenation in real-time.
- Maximum force expressed during a leg extension

Immediately after the race (in a room ~100 m far from the finish line):

- Anthropometrics (weight, stature)
- Incremental test on a modified cycle ergometer that allows extending only the lower limb. The test will start with a low resistance and then it will be increased every minute until the volitional exhaustion.
- Maximum force expressed during a leg extension

We request to the athletes:

- Before the race: to come to the laboratory in Udine for the first test (~1h)
- During the race: to collect heart rate and power data (only for athletes who have the heart rate monitor and power meter)
- Immediately after the finish of the race: to repeat the test done before the race



Also, we will offer to the athletes who take part in the project, the possibility to perform a free incremental test with cycle ergometer at the laboratory in Udine. During this test we measure the maximal oxygen uptake ($\dot{V}O_2\text{max}$) and we find the anaerobic threshold and the power-HR associated. Then, athletes can use these results to optimize their training. **This incremental test has to be performed in a different day than the other tests.**

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