

July 2020



Master's Thesis project at Xlab, Department of Biomedical Sciences, UCPH
Title: Physiological and Nutritional Effects on Maximal Fat Oxidation

Background

Fat is the dominant fuel during low to moderate intensities of exercise while carbohydrates become the dominant fuel during high intensity exercise. Furthermore the oxidation of fat increase with increased exercise duration and the fat oxidation has gaining a lot of attention as a glycogen sparing strategy to increase performance. In the last decade major focus has turned towards determining maximal fat oxidation rates (MFO) and it has recently been found to be related to performance in endurance trained men. However, MFO varies noticeably amongst individuals who are well matched for fitness and training status. This may mean that individuals with similar levels of fitness perform differently due to their fuel preference during exercise. In other words, those categorised as 'high fat burners' may be able to preserve carbohydrate stores and perform better during prolonged exercise in comparison to 'low fat burners'. About 50 % of the variation in MFO can be explained by variation in physical activity, lean body mass, the diet and metabolic factors. However, the variability in MFO capacity remains largely unexplained and the underlying physiological mechanisms and the effect of diet on trained individuals with similar levels of fitness remain somewhat unresolved.

The project

40 health and moderate to well-train male participant in the age 18-40 year old will be recruited for the study. The participants are separated into two groups: one with a high MFO (n=20) and one with a low MFO (n=20) and the participants will either consume a fat-rich or a carbohydrate-rich diet for 3 days. The physiological and nutritional measurements, as well as blood samples and tissue biopsies (adipose tissue and skeletal muscle) will be collected before and after the diet intervention. The main goal of the project is to investigate the physiological and nutritional determinants of MFO in moderate to well-train individuals.

The Student

We are seeking a motivated MSc student in Human Nutrition, Human Physiology or similar. Laboratory experience is advantageous but not necessary. Start date 1st of September or as soon as possible thereafter.

You will:

- Be involved in a project investigating the physiological and nutritional effects om MFO during exercise
- Work with diet analysis and learn to analyse human tissue and blood
- Measure body composition, aerobic capacity and the maximal fat oxidation during exercise.

Contact

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The project mainly takes place at Xlab, Department of Biomedical sciences (BMI), with Professor, Jørn Wulff Helge as main supervisor and PhD Sofie Vestergaard as daily supervisor.