AARHUS UNIVERSITY

Press release

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Basic information

Name: Simon Riis Email: sriis@ph.au.dk Phone: 51231656

Department of: Public Health

Main supervisor: Niels Jessen, Professor, Head of Research, Steno Diabetes Center Aarhus

Title of dissertation: "New molecular and methodological insights into human fat metabolism in endurance exercise"

Date for defence: Jan 29 2020 at (time of day): 1pm Place: William Scharff Auditorium, Aarhus University, Bartholins Allé 3, 8000 Aarhus C

Press release (Danish)

Nye molekylære og metodiske indsigter i menneskets fedtstofskifte i forbindelse med udholdenhedstræning

Udholdenhedstræning mobiliserer fedt fra primært subkutant fedtvæv og skeletmuskler; hvis det udføres regelmæssigt, sikrer udholdenhedstræning, at kroppen skifter mellem at lagre og mobilisere fedt, hvilket på den lange bane er afgørende for at bevare eller forbedre den metaboliske sundhed. Forbrænding af fedt er yderst regulerbar, og visse strategier til at opregulere fedtforbrænding under udholdenhedstræning har udvist potentiale til at forbedre udholdenhedspræstationsevnen hos veltrænede individer. Imidlertid er nuværende metoder til at estimere fedtforbrændingen under intenst arbejde utilstrækkelige, hvilket influerer på vores viden om vigtige aspekter af fedtforbrænding under udholdenhedstræning. Et nyt ph.d.-projekt fra Aarhus Universitet, Health, har studeret essentielle aspekter af menneskets fedtstofskifte og fedtforbrænding i forbindelse med udholdenhedstræning. Projektet er gennemført af Simon Riis, og består af tre forskellige videnskabelige studier af mænd i alderen 18-50 år:

1) Effekten af 10 ugers udholdenhedstræning på mængden af proteiner i subkutant fedtvæv med betydning for lagring og mobilisering af substrat (primært fedt og kulhydrat).

2) Effekterne på udholdenhedspræstations- og fedtforbrændingsevne af en 4-ugers kombineret kost- og træningsstrategi, hvor kulhydratindtaget blev periodiseret strategisk for at opregulere fedtforbrændingen i udvalgte træningssessioner hos veltrænede motionscykelryttere.

3) Udvikling af en ny metode til at estimere fedtforbrændingen under intenst arbejde.

Samlet set viser ph.d.-projektet, at udholdenhedstræning forbedrer fedtvævets evne til at optage substrat samt til at regulere mobiliseringen af fedt, imens strategisk periodisering af kulhydratindtag ikke resulterer i yderligere adaptationer, hvad angår udholdenhedspræstationsevne eller fedtforbrændingsevne hos veltrænede individer. Arbejdet med udvikling af en ny metode til at estimere fedtforbrændingen under intenst arbejde er endnu ikke afsluttet.

Forsvaret af ph.d.-projektet er offentligt og finder sted onsdag den 29. januar 2020 kl. 13.00 i William Scharff auditoriet, Aarhus Universitet, Bartholins Allé 3, 8000 Aarhus C. Titlen på projektet er ”New molecular and methodological insights into human fat metabolism in endurance exercise”. Efterfølgende er alle deltagere inviterede til reception med Simon på samme adresse.

Yderligere oplysninger: Ph.d.-studerende Simon Riis, e-mail: sriis@ph.au.dk, tlf. 51231656.

Bedømmelsesudvalg:

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Press release (English)

New molecular and methodological insights into human fat metabolism in endurance exercise

Endurance exercise mobilizes fat stored primarily in subcutaneous adipose tissue and skeletal muscle; if performed on a regular basis, endurance exercise ensures that the body cycles between fat storage and mobilization, which in the long run is essential to maintain or improve metabolic health. Fat burning is highly variable, and certain strategies to upregulate fat burning during endurance exercise has shown potential to improve endurance performance in well-trained individuals. However, current methods to estimate fat burning during intense exercise are inadequate, and this affects our knowledge about important aspects of fat burning during endurance exercise. A new PhD project from Aarhus University, Health, has investigated essential aspects of human fat metabolism in endurance exercise. The project was carried out by Simon Riis, and consists of three different scientific studies of men aged 18-50 years:

1) The effect of 10 weeks of endurance exercise training on the expression of proteins in subcutaneous adipose tissue involved in susbtrate storage and mobilisation (primarily fat and carbohydrate).

2) The effects on endurance performance and fat burning capacity of a 4-week combined diet-exercise strategy, where the carbohydrate intake was periodized strategically to upregulate the fat burning during selected training sessions in well-trained road cyclists.

3) Development of a new method to estimate fat burning during intense exercise.

Collectively, the PhD project suggest that endurance exercise training improves the capacity for substrate uptake and regulation of fat mobilization in adipose tissue, while endurance exercise training in combination with carbohydrate periodization does not result in additive adaptations with respect to endurance performance or the capacity to burn fat in endurance-trained individuals. The development of a method to estimate fat burning during intense exercise remains a work in progress.

The defence is public and takes place on January 29, 2020, at 1pm at the William Scharff Auditorium, Aarhus University, Bartholins Allé, Aarhus C. The title of the project is "New molecular and methodological insights into human fat metabolism in endurance exercise". Following the defence, there will be a small reception for those who attended.
For more information, please contact PhD student Simon Riis, email: sriis@ph.au.dk, Phone +45 51231656.

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