

28th ECSS Anniversary Congress, Paris/France, 4-7 July 2023

Changes in peak fat oxidation from preseason to competitive season in professional male football players

Rømer, T.1, Hansen, M.T.1, Sahl, R.E.1, Lange, K.1, Blom, I.1, Schmücker, M.1, Poggi, A.I.1, Larsen, M.N.2, Dela, F.1, Krstrup, P.2, Helge, J.W.1

< 1> Department of Biomedical Sciences, University of Copenhagen; <2> Department of Sports Science and Clinical Biomechanics, University of Southern Denmark

INTRODUCTION:

Football is an intermittent sport with high aerobic and anaerobic energy turnover demands, and high-intensity running bouts during matches are considered decisive. Interestingly, recent studies found that peak fat oxidation rates (PFO) are high in professional football players compared to other athlete types. It remains unexplored whether PFO varies during a season and if PFO has implications for physical performance in football. This ongoing study aims to investigate if PFO increases from the early preseason period to competitive season and if PFO is related to the physical performance in match-play for professional male football players.

METHODS:

36 professional male football players from the Danish Superliga undergo laboratory testing during the first week of winter preseason and 11 weeks later during the competitive season (in-season). Testing is conducted during season 2021/22 and 2022/23 and consists of a whole-body dual-energy x-ray absorptiometry scan (body mass: 79.4 ± 2.5 kg, fat-free mass: 65.2 ± 1.9 kg, fat percentage: $13.1 \pm 0.9\%$, (mean $\pm$ 95% confidence interval) and a graded exercise test on a treadmill determining PFO, the intensity eliciting PFO (Fatmax) and peak oxygen consumption ($\text{VO}_{2\text{peak}}$) (0.63 ± 0.07 g/min, $40 \pm 3\% \text{VO}_{2\text{peak}}$ and 57.0 ± 1.6 ml/min/kg, respectively).

Furthermore, the players' physical performance is assessed by in-match measurements of running speed and heart rate, but these data are yet to be collected and analysed.

RESULTS:

At the current stage, nine players have completed in-season testing (season 2021/22) and compared with preseason levels (paired t test) no changes were observed for PFO (mean change: 0.03 ± 0.11 g/min, $p=0.494$) and Fatmax ($2 \pm 11\% \text{VO}_{2\text{peak}}$, $p=0.690$). $\text{VO}_{2\text{peak}}$ did not increase significantly from preseason to in-season testing (1.6 ± 1.7 ml/min/kg, $p=0.064$). The fat percentage decreased by $1.2 \pm 0.9\%$ -points, $p = 0.015$, due to a 1.0 ± 0.7 kg, $p=0.014$, decrease in fat mass and a numerical increase in fat-free mass (0.8 ± 1.1 kg, $p=0.126$).

CONCLUSION:

The preliminary results suggest that PFO and Fatmax are not increased in-season compared with early preseason, whereas $\text{VO}_{2\text{peak}}$ tends to increase and the body composition becomes leaner during the same period in professional male football players. This implies that football preseason training does not improve PFO in highly adapted players, however it remains to be seen whether PFO is associated with physical performance in match play for professional male football players.

Topic: Training and Testing

Presentation Oral

European Database of Sport Science (EDSS)

Supported by SporTools GmbH



27618