

## **Abstract**

**Title:** Effect of a bicycle's component on the energy expenditure

**Objectives:** Aim of this bachelor's thesis is to determine the difference of energy expenditure in a different component mounting frame of the bicycle.

**Methods:** The study involved 6 probands aged  $25.5 \pm 3.6$  years. Energy expenditure was calculated on the basis of oxygen consumed ( $O_2$ ) and carbon dioxide exhaled ( $VCO_2$ ). To measure was used exhaled gas analyzer Metamax from Cortex and method spiroergometry. Probands completed two runs cadence of 95 rounds per minute on a bicycle with a different component (a shock). Completed line measured 750 meters, led to a gradient of  $5^\circ \pm 2^\circ$  and lasts 3 minutes.

**Results:** In our study we found that the differences in energy intensity during bicycling on a hard-tail bike compared to a full-suspension are due to the standard error of the analyzer exhaled gases Metamax® insignificant.  $VO_2$  values during the study period did not exceed the threshold of 2 ml /kg/min for the confirmation the authenticity of our hypothesis. Cycling with two shock-absorbers at a distance of 750 m long and 3 minutes remains segment with the inclination of  $5^\circ \pm 2^\circ$  cause energy expenditure in the average value of  $161.23 \pm 33.15$  kJ versus bicycling without shock-absorber and  $160.98 \pm 24.10$  kJ expenditure, which represents an increase of 0.15%.

**Key words:** **bicycle, energy expenditure, components, bike suspension**