

Abstract

EFFECT OF DIFFERENT SIZES OF WHEELS OF IN-LINE SKATES ON ENERGY EXPENDITURE

Objectives: The aim of this bachelor thesis is to determine the difference in energy expenditure when using different sizes of wheels of in-line skates.

Methods: The research group consisted of 5 people in age $26,4 \pm 2,2$ years. This was an experiment. The calculation of energy expenditure was based on the amount of oxygen consumption (VO_2) and exhaled carbon dioxide (VCO_2), i.e. indirect calorimetry. For the analysis of respiratory gases MetaMax 3B measuring device was used. Three sizes of wheels of the same hardness were tested. The rides were carried out on a 1,5 km section of a cycle path with the effect of the height difference of 2 mm/m. Proband completed one test ride (with a cadence of 70 rpm) on each size set of wheels. Test ride lasted for 5 minutes. For results were processed values of 3 minutes steady state VO_2 .

Results: We found out a noticeable difference in energy output between 72 mm and 90 mm large wheels. The difference between driving on 72 mm and 80 mm large wheels and driving on 80 mm and 90 mm large wheels was, due to the standard error of measurement, insignificant.

Conclusion: The energy expenditure reached a noticeable increase in driving with a larger diameter of wheels compared to driving on wheels with smaller diameters. The hypothesis was unconfirmed.

Keywords: in-line skates, wheels, rolling resistance, oxygen consumption, spiroergometry, indirect calorimetry