Thesis Title	Effect of Warm-Up with Varied Rest Intervals on Maximum Oxygen Uptake and Circulatory Adaptations Based on Submaximal Exercise Using the Astrand Method
Name	Mr. Phaitoon Yaemprasuan
Thesis Advisor	Associate Professor Prapat Luxanaphisuth
Department	Physical Education
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ABSTRACT

The purpose of this study was to investigate the effect of warm-up with varied rest intervals on maximum oxygen uptake and circulatory adaptations based on submaximal exercise using the Astrand method.

The subjects were twelve selected male senior high school athletes who were 17-18 years of age, 56-62 kilograms of weight, and 165-174 centimetres of height. Each subject performed warm-up exercise on a bicycle ergometer at a workload designed to elevate heart rate to approximately 140 beats per minute. After the warm-up , the subjects rested for 30, 60, and 90 seconds before starting a cardiorespiratory criterion task. They also performed the criterion task once without any warm-up. The criterion task required the subject to begin pedaling a bicycle ergometer at a workload of 900 kilopond-metres per minute for six minutes, then increased 150 kilopond-metres per minute for every two minutes. The exercise bout was stopped when the

subject's heart rate achieved approximately 180 beats per minute. Maximum oxygen uptake was predicted from the exercise heart rate using the Astrand-Rhyming method, and the five items of circulatory adaptations, (resting heart rate, resting mean blood pressure, exercise heart rate, recovery heart rate, and recovery mean blood pressure), were measured.

The obtained data were then analysed in terms of Means and Standard Deviations. One Way Analysis of Variances and the Multiple Comparisons of Scheffé were finally employed to determine the significant differences.

There were no significant differences among warm-up with varied rest intervals and no warm-up on maximum oxygen uptake and circulatory adaptations at the .05 level. From this analysis, therefore the hypothesis was retained.