Thesis Title Effect of High Carbohydrate Diet and Normal Diet with Sodium Bicarbonate on Blood Biochemistry and Physical Performance in the Cyclists

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## ABSTRACT

The purpose of this study was to determine the effect of high-carbohydrate diet and normal diet with sodium bicarbonate on blood biochemistry and physical performance in the ten cyclists.

In the trial, the subjects consumed the experimental diet for 3 days before the exercise test. After taking each diet, they performed 2 exercise tests on bicycle ergometer. The first test was to measure the anaerobic power and capacity (Wingate test).The second, after a two-hour rest period, the subjects worked at 80 percent of their maximum oxygen uptake to exhaustion for endurance time measurement. Blood samples were

taken before the exercise,during 5 minutes of exercise, and at exhaustion.

The results showed that high-carbohydrate diet improved the male cyclists's endurance as shown by the increase of endurance time in working at 80 percent from 18.3 $\pm$ 11.9 minutes in normal diet to 22.2 $\pm$ 12.3 minutes in high-carbohydrate diet. However, no increase of endurance time in normal diet with sodium bicarbonate was observed. Moreover, the anaerobic power and capacity after high-carbohydrate diet or normal diet with sodium bicarbonate were not improved when compared to normal diet.

Plasma glucose levels measured at different time during exercise of the male cyclists were decreased in 3 experimental diets. At the same time, levels of plasma glucose during exercise for 5 minutes after high-carbohydrate diet were significantly higher than normal diet in the male cyclists. This might due to the increase of muscle glycogen store in high-carbohydrate diet.

During exercise, blood lactate levels were increased above the resting levels in 3 experimental diets. Because this high exercise intensity test was an anaerobic exercise in adaptation period and this exercise was above anaerobic threshold in which lactic acid increased.

Levels of plasma bicarbonate concentration during normal diet with sodium bicarbonate were not different from plasma bicarbonate concentration during normal diet. This might due to the fact that the dose of sodium bicarbonate used in this study was not high enough to influence the body reservation of bicarbonate.

It can be concluded that high-carbohydrate diet improved endurance time in the male cyclists during exercise at 80 percent maximum oxygen uptake. Whereas the dose of 0.1 g/kg body weight of sodium bicarbonate could not elevated plasma bicarbonate and would not significantly improve the endurance time and the anaerobic performance.