

INTRODUCTION

Nutrition is one of the most important factors for general health. In the field of exercise, nutrition can optimize athletic performance. Appropriate nutrition can reduce fatigue, which allows the athlete to train for longer duration, or faster recover between exercise sessions. Additionally, nutrition can possibly reduce injuries, or speed injury repair, ultimately affecting training status. It can also optimize energy stores for competition, which may make the difference between first and second places for both sprint and endurance activities. Adequate nutrition reduces the possibilities of infirmities which can reduce training time or even shorten an athlete's career. With all of these benefits, current research focusing on nutrition and endurance performance has received much attention.

During exercise the two primary substrates available for use by the working skeletal muscle are carbohydrates (CHO) and fats. These substrates can be supplied by muscle (glycogen and triglycerides) or by liver in the case of glucose and from the adipose tissue in the case of fatty acids. A considerable amount of evidence demonstrates that depletion of muscle glycogen and/or the development of hypoglycemia are major factors in the development of exhaustion during prolonged strenuous exercise. It is likely that endurance can be increased by raising, and diminished by lowering, body carbohydrate stores. Thus, carbohydrate loading, a procedure by which muscle glycogen levels are

augmented before an endurance event by consumption of high carbohydrate diet, has long been accepted. Also, an important determinant of exercise training has been widely recognized as endurance performance. A natural adaptation to endurance training is a slower utilization of muscle glycogen and a greater fat oxidation during exercise at any given submaximal work intensity. However, consumption of high carbohydrate diet lead to an abatement of β -oxidation which negates the training - induced shifts toward lipid metabolism seen during endurance exercise performance.

From the view point that elevation of circulating fatty acids, which is seen during a fat diet, tends to spare muscle glycogen use during exercise and increases exercise time to exhaustion, has prompted investigators to consider the influence of high fat diet on exercise performance. It has been well documented that animals and humans adapt to high fat diet in much the same way as they do to exercise training. Combination of the training and a high fat diet results in an additive effect and, by inference, in maximal endurance capacity. Previous studies indicated that high fat and high carbohydrate diets enhanced exercise performance which was superior to normal diet. Thus the aims of the present study were 1) to compare the exercise performance in trained rats that received a high carbohydrate diet or high fat diet, 2) to investigate whether or not a prolonged fat or carbohydrate diet, followed by a different proportion of fat and carbohydrate diet, affects exercise endurance time and 3) to assess the

appropriate dietary regimen necessary for optimal exercise performance in trained rats.

มหาวิทยาลัยเชียงใหม่
Chiang Mai University