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## Solutions to improve physical fitness for athletes through improved nutrition

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### Abstract

The relationship between nutrition and health has been clearly established. Even if you are a normal person, if you want good health, you need to have good nutrition. Especially for athletes, the foundation for improving performance must be a nutritious diet. Whether a competitive athlete, a weekend sportsman or someone who exercises regularly every day, the foundation of exercise performance and improved performance is a nutritious diet.

**Keywords:** nutrition, exercise, health

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### 1. Introduction

Athletes need scientific nutrition to increase strength and endurance during training and achieve good results in competition. Poor nutrition can lead to fatigue, injury, and poor recovery, all three of which can hinder an athlete's performance. According to the American Dietetic Association, physical activity, athletic performance and recovery after exercise are enhanced by optimal nutrition. Therefore, athletes need to have adequate nutrition, choose appropriate foods, and eat at the right time to have good health and exercise performance. Nutrition needs to be nutritious and diverse to help athletes achieve optimal body weight and fat levels for competition; provide enough fluids to ensure maximum hydration before, during and after exercise and enhance athletes' health.

### 2. Research content and results

#### 2.1. Nutrition when exercising

A balanced diet can help athletes and gym goers get the calories and nutrients needed to fuel their day's activities, including regular exercise. Having a nutritional regimen that boosts your exercise performance isn't as simple as choosing what's on the table.

The first meal of the day plays an important role in our nutrition. Maintaining a regular breakfast habit is effective in reducing the risk of obesity, diabetes and heart disease. Starting a new day with a healthy breakfast can help replenish energy for your muscles and brain to function at their best. A healthy breakfast is especially important when you exercise. Skipping breakfast can make you feel lightheaded or lethargic while working, and you won't have enough energy to exercise anymore. Choosing the right foods for breakfast is very important. There are many people who choose simple carbohydrates to start their day. Just a sandwich or donut won't keep you full for long.

On the contrary, a breakfast rich in fiber and protein will keep you hungry longer and provide you with the energy you need to maintain your exercise routine. Some basic rules for a healthy breakfast: instead of eating sugary cereals made from refined grains, try using oats, oat bran, or other whole-grain types that contain lots of fiber. Then, add some protein like milk or yogurt. If you're baking, replace some all-purpose flour with whole grains. Add a little cheese to the dough and stir well. If you like toast, choose whole grain bread. Add in an egg, peanut butter or another source of protein.

Carbohydrates are the main source of energy for the body. About 45 - 65% of your total daily calories should come from carbohydrates, especially when you exercise or hit the gym. Choosing the right type of carbohydrate is very important. Many people choose simple carbohydrates found in sweets or processed foods. This is really not good, instead you should choose more complex carbohydrates found in whole grains, vegetables, beans and fruits. Whole grains have more staying power than refined grains because they are digested more slowly. They will help you feel full longer and provide your body with energy throughout the day. At the same time, it also helps stabilize blood sugar levels. In addition, these cereals also contain essential vitamins and minerals to help the body function at its best.

Food plays a particularly important role in the health and training effectiveness of each athlete. Therefore, you need to include foods such as: whole grains, fruits, vegetables, meats, healthy fats and low-fat dairy products. Nutritional sources can be supplemented through diet. However, it may not meet the energy needs of many athletes. Therefore, you can supplement with multivitamin pills, omega-3 fatty acids.

In addition to a healthy diet, adding carbohydrates to fuel exercise reduces stress on the immune system. Because carbs can help limit stress hormone responses and provide fuel for immune cell function. In particular, consuming carbs during exercise helps limit the immunosuppressive effects that occur after heavy exercise.

In general, topical carb supplementation has the following effects: Preventing fatigue before exercise, maintaining energy consumption during exercise lasting more than 60 minutes, storing energy for the next workout or next competition. Regular exercise helps strengthen the immune system and improve health. However, you should consider a suitable exercise schedule, combined with a healthy diet to ensure effective exercise performance.

## 2.2. The role of nutrition in sports training and competition

According to nutrition experts, a basic exercise diet must be enough to provide energy to meet exercise needs; Enhance adaptation and recovery between training sessions.

Nutrition needs to be nutritious and diverse to help athletes achieve optimal body weight and fat levels for competition; provide enough fluids to ensure maximum hydration before, during and after exercise and enhance athletes' health. Indispensable groups of substances in sports nutrition include: carbohydrates; fat; protein; fiber, vitamins and minerals, water.

**Carbohydrates:** Carbohydrates are stored in the body as glycogen, which can be used during physical activity. Carbohydrates are needed to meet the energy needs required during exercise, maintain blood sugar levels, and replenish muscle glycogen stores. Low pre-workout muscle glycogen levels will reduce high-intensity performance, so carbohydrate intake should be emphasized throughout the entire training and competition phase.

**Fat:** Fat is primarily used as fuel during low to moderate intensity exercise. Fat also participates in providing structure for cell membranes, helps produce hormones, nerve membranes to function normally and facilitates the absorption of fat-soluble vitamins.

**Protein:** Protein is essential for transporting nutrients in the blood, supporting connective tissue, and repairing tissue in response to exercise. For people who don't get enough protein in their daily diet, recovery and training adjustments are

slower.

The function of protein in promoting athletic performance is divided by activity level. Athletes looking to gain muscle and strength will likely have higher amounts of protein in their diet than endurance training athletes.

**Vitamins and minerals:** Vitamins are essential for many body functions and activities, helping the body stay healthy and disease-free. The function of minerals is to develop the structure of tissues as well as regulate body processes.

**Water:** The human body can survive for some time without any nutrients but it cannot do without water. Water is present almost everywhere in the body's tissues and fluids. In sports, water is especially important for regulating temperature, lubricating joints, and transporting nutrients to active tissues. It regulates body temperature and protects vital organs, supports the digestive system, and works in every cell to transport nutrients and eliminate waste.

The amount of nutrients for athletes is not much different from normal people. However, the ratio of these substances is different, depending on the type of sport, stage of training and must depend on each individual. In general, compared to normal people, energy levels may increase or be equal; Protein is needed more because athletes have to strengthen muscle; Fat used in moderation can be on par with normal people, but fat must be beneficial to help the cardiovascular system function well; It is necessary to increase vitamins and minerals because athletes have to exercise intensely, so they need vitamins to metabolize energy and minerals to help regulate the body. In addition, each person has a different physical condition: some are fat, some are thin due to different genetics and metabolism, have different diseases. Each individual needs to be examined by a specialist to be diagnosed. Advice on appropriate nutrition and exercise.

## 2.3. Proper nutrition contributes to improving physical fitness for athletes

Athletes often have a different diet than normal people, they need more energy and micronutrients to maintain strength and energy to maintain their performance at the highest level. For athletes, they need more energy and macronutrients than the average person to maintain strength and energy to maintain performance at the highest level. Athletes also need to supplement vitamins, minerals and other nutrients to help recover and achieve peak athletic performance.

Nutrition is especially important for athletes' health and their ability to perform. A diet suitable for each individual not only helps provide energy but also nutrients to meet other needs of the body when training or competing.

In addition, nutrition also helps them stay in the best shape and recover after exercise faster. Factors that athletes need to pay attention to in their diet include: energy needs, quantity and ratio of macronutrients, timing of meals and snacks, vitamins and minerals to promote recover quickly, always drink enough water.

Adjusting factors to suit their weight, body composition, amount of training time and the sport they participate in will help them improve their performance when training and competing. First, nutrients in food include two types: macronutrients and micronutrients. In particular, macronutrients are substances that produce energy to help the body regenerate tissues, maintain body temperature, grow and function.

Macronutrients include protein, lipids and carbohydrates. On

the other hand, micronutrients are nutrients that have very small amounts but play an important role in the body's development process. Without them, the body may stop growing. According to the US dietary guidelines, optimal macronutrient ratios for adults include:

Carbohydrates account for 45-65% of the body's energy needs

**Protein accounts for 10-35% of energy needs**

**Fat accounts for 20-35% of energy needs**

The International Sports Science Association (ISSA) notes that people can adjust these ratios based on their individual fitness goals. For example, an endurance athlete will need to increase his carbohydrate intake, while a strength athlete will need to increase his protein intake.

For athletes, understanding their energy needs and energy consumption levels is very important to achieve their best performance. Experts estimate that athletes who exercise intensely 2-6 hours a day, 5-6 days a week can burn more than 600-1200 calories per hour while exercising. Therefore, athletes participating in this level of activity require 40-70 calories per kg of body weight, which is twice as much as the average person's recommendation of 25-35 calories/kg. kg weight. Accordingly, athletes weighing 50-150kg may need 2000-7000 calories per day. Especially for athletes weighing 100-150kg, they may need 6000-12000 calories per day to meet training needs.

Athletes have different nutritional needs depending on the sport they participate in. It can be difficult for professional athletes to consume enough food to meet their energy needs without causing gastrointestinal upset, especially right before a training session or a competition. Experts recommend choosing foods containing easily digestible carbohydrates, such as bananas and pasta, before training or competing to help avoid gastrointestinal discomfort. Athletes should consult with a nutritionist to ensure they are consuming enough calories and nutrients for their body weight to optimize performance and recovery. At the same time, they can arrange a diet suitable for their body, sport and schedule.

### 3. Conclusion

Athletes need to specifically plan their meals to optimize health and performance during training and competition. They should consider their calorie needs, macronutrients and ensure a varied diet to provide essential vitamins and minerals. Water and meal timing are also important for staying active throughout the day. An athlete may choose to use supplement products, however, safety and effectiveness must be considered, while ensuring those products comply with the requirements of the sports association.

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