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NUTRITION AND SPORTS

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Abstract:

Introduction:
Aside from training, nutrition is the most important influence on sports performance. To reach one's highest potential, all of the body's systems must be working optimally. The best way to achieve this is to eat a variety of nutritious foods. Calories, carbohydrate, protein, fat, vitamins, minerals, and fluids all play a unique and crucial role.

Calories:
To have enough energy for exercise (and for life), an adequate number of calories must be consumed. The amount of calories needed depends on many different factors, such as age, sex, and height, and weight, muscle mass and fat mass. Too few calories can negatively affect workouts and energy levels, as well as cause the breakdown of muscle and bone, increasing the risk of injury.

It is important to nourish the body after several hours with no food (such as during sleep), so breakfast is an important part of adequate calorie intake. Choosing high-nutrient foods—such as fortified cereals with milk, peanut butter with whole grain bread, yogurt, cheese, or fruit—gives the body the right fuel to start the day. Nutritious meals and snacks can also help the body stays fueled throughout the day.

Carbohydrates:
Carbohydrates are the body's main energy source for all types of exercise. Carbohydrate is stored as glycogen in the body, and the amount of glycogen stored in the body affects stamina and endurance. When muscle cells run out of glycogen, fatigue sets in and performance will suffer, though the effects will vary among different sports. Training and eating properly, with particular attention to carbohydrates, can increase and maintain glycogen stores, which is particularly important for endurance athletes.

A large part of an athlete's diet should be carbohydrate. Foods high in carbohydrate include pasta, rice, cereals, starchy vegetables (e.g., potatoes, carrots, corn, and sweet potatoes), fruit, and bread. Not all carbohydrates are equal in providing needed nutrients, however. Focusing on carbohydrate from whole grains, fruits, and vegetables will make sure vitamins, minerals, fiber, and other important nutrients are part of one's diet, while filling up on too many sweets and processed foods can negatively impact sports performance.

Protein:
Protein is essential to build and repair muscle tissue. Protein allows muscles to contract, gain in size, and increase in strength. Loading up on protein does not guarantee larger muscles. Protein in excess of the body's needs is stored as fat, not protein. Muscle growth comes from hard work, proper training, and balanced nutrition. Food sources of protein include lean meat and poultry (fish and chicken), fish, legumes (dried beans and peas), nuts, seeds, and dairy products. Protein needs for

active athletes, especially endurance sports, are higher than for non-athletes. The maximum recommended amounts of protein are 1.2 to 1.4 g/kg of body weight. This requirement can be met through diet alone.

Fat provides energy, protects the body's organs and helps with the absorption of some vitamins. When fats are eaten as part of healthful foods, they provide an important energy source for athletes in training. Good choices include the fats from nuts, seeds, vegetable oils (canola, olive, peanut), and avocados.

When the body is dehydrated, blood circulation decreases and the muscles do not receive enough oxygen for maximum performance. Thirst is an indication that dehydration has already occurred, so it is important to drink frequently during exercise, before thirst sets in.

Vitamins and Minerals:

All vitamins and minerals are important. Two that deserve special attention from athletes are iron and calcium. Iron is important to carry oxygen in blood, and it plays a key role in sports performance. The best sources of iron are lean red meats, shrimp, iron-fortified cereals, and bread products.

Calcium keeps bones strong. Foods from the dairy group, including milk, yogurt, and cheese are excellent sources of calcium. Non-dairy sources of calcium include dark leafy green vegetables, but the calcium may not be absorbed as well. There are also many calcium-fortified juices and foods that can help boost calcium intake. In addition, weight-bearing exercises increase bone density. Calcium needs for female teenage athletes is 1300 mg daily.

Fluids:

Water is critical to all body functions and makes up about 60 percent of a person's body weight. Water helps move nutrients throughout the body and helps remove waste from the body. Replacing the fluids lost during exercise is essential to sustaining performance, preventing dehydration, and avoiding injury. Even mild dehydration can cause muscle and body fatigue, which will reduce athletic performance. Since thirst is not always a reliable indicator of fluid loss, athletes should drink fluids before they get really thirsty.

Eight to ten cups a water a day is the recommended daily intake for most people. However, extra fluids are needed by athletes to replenish what is lost during exercise. Drinks with caffeine or alcohol should be avoided, as they are dehydrating. Exercising in extreme heat increases fluid needs even more, since more is lost through sweat. Taking in too much water can be just as dangerous as not taking in enough. Athletes should experiment with different fluid intakes to determine the best amounts for optimal performance.

Sports drinks can be helpful, especially for events lasting sixty minutes or longer. In addition to fluid, they provide the advantage of quick replacement of carbohydrate and minerals and also replace electrolytes lost in sweat.

Fluid Intake Guidelines

Time in reference to event	Ounces of fluid (oz.)
24 hours before	Drink freely
2 hours before	8–16 oz.
15 minutes before	8–16 oz.
During	4 to 8 oz. every 15–20 minutes
After	Drink freely

Another advantage is taste. Athletes may be more likely to drink more fluid if the beverage has a desirable flavor. The ideal carbohydrate solution is 4 to 8 percent carbohydrate, which is typically found in sports drinks.

Sports Supplements:

Sports supplements are advertised widely and promise increased power and strength, improved athletic performance, and better overall health. However, in addition to being potentially dangerous, they can be extremely expensive.

The majority of supplements have not been researched thoroughly, especially on teenage athletes. In addition, long-term studies on safety are not extensively available. Stimulating herbs such as

guarana and yohimbine can cause anxiety and dizziness. One dangerous example is ephedra, which can have adverse effects such as nervousness, irregular heartbeat, and can be deadly in some cases. Creatine supplements may negatively affect kidney function and promote dehydration. Amino acid and protein supplements, while not dangerous, are an unnecessary expense when diet alone can meet protein needs. No supplement is the world can take the place of hard training and proper nutrition, and food should be the first priority in an athlete's nutrition program.

The Timing of Meals:

The importance of what foods are eaten is matched only by when they're eaten. Proper nutrition is important not just on the day of competition, but on a daily basis. Eating a meal or snack an hour or so before athletic activity will provide energy without having a full stomach. It is also important to replenish the body's stores after athletic activity. A meal or snack within one hour of activity will assure this. Carbohydrates should be the main focus, along with protein in smaller amounts.

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