

11



Nutrition for Exercise

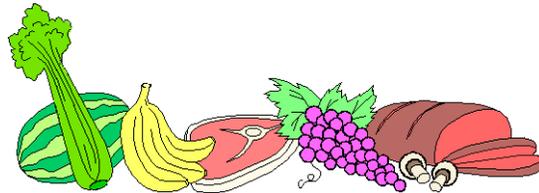


In this chapter you will learn about:

- ◆ Dietary practices for enhancing endurance and strength performance.
- ◆ Dietary measures for exercise recovery.

Your physical performance is greatly influenced by regular conditioning and by following sound dietary practices. Both prolonged aerobic exercise and multiple bouts of high intensity exercise impose significant demands on energy and fluid balance. Failure to replace energy and fluids used during exercise can significantly impair performance in later activities.

The following recommendations are for an individual who regularly participates in at least 90 minutes of aerobic exercise each day or in multiple, strenuous bouts of exercise several times a week. This information does not apply if you exercise less than one hour per day.



Carbohydrate Needs

During heavy training you must increase your kcal intake, especially from carbohydrates (CHO), to meet your energy demands. Failure to do so may result in:

- ◆ Chronic muscular fatigue.
- ◆ A feeling of staleness.
- ◆ Weight and muscle mass loss.
- ◆ Poor sleep patterns.

Liver and muscle glycogen are the primary sources of glucose for energy during prolonged and intense physical activities. Once your glycogen stores are used, your performance decreases sharply. So, the key to optimal performance is to maintain glycogen stores by eating a high-CHO diet.

CHO for Endurance Training

The endurance capacity of an individual on a high-CHO diet is approximately **3 times greater** than on a high-fat diet. When CHO intake is low, several days of rigorous training will result in a gradual depletion of muscle glycogen stores and eventually impair performance. The guidelines for CHO intake while training are:



60 - 65% of your total daily kcal intake.

Worksheet 11-1. Calculate Your Daily CHO Needs

_____ x 0.60 = _____ kcal from CHO per day.
Your EER*

_____ x 0.65 = _____ kcal from CHO per day.
Your EER*

You should eat _____ to _____ kcals from CHO daily.

* Your estimated energy requirement (EER) was calculated in Chapter 1, Worksheet 1-2.
To calculate grams of CHO see Worksheet 2-1.

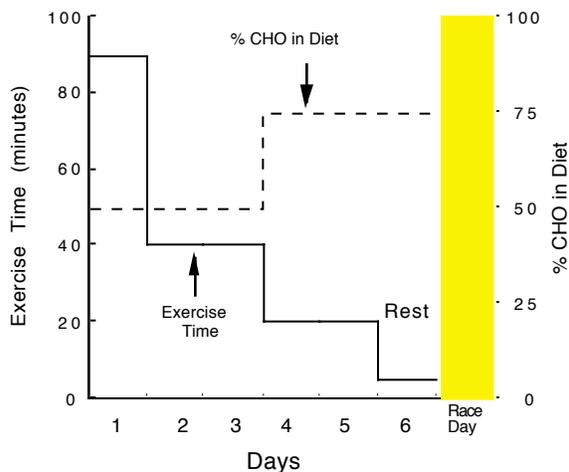
Keep a dietary log for a few days to see if your CHO intake is adequate.

CHO Loading/Glycogen Supercompensation

CHO Loading is a regimen that combines diet and exercise to “pack” more glycogen into muscle and liver ([Figure 11-1](#)). It is used by endurance athletes to optimize physical performance during prolonged endurance events. CHO loading causes temporary weight gain (2.7 grams of water are stored with every gram of glycogen). The extra weight may impair performance. CHO loading is unnecessary for individuals who eat according to the dietary guidelines outlined in [Chapter 3](#) and whose CHO intakes are within the range calculated in [Worksheet 11-1](#).



Figure 11-1. CHO Loading for Endurance Events



CHO loading requires that you reduce your training sessions and increase your CHO intake the week prior to an event. As shown to the left, five to six days before the event train no more than 40 minutes (solid line). CHO intake (dotted line) should be approximately 50% of your total energy intake. Two to three days before the event train no more than 20 minutes a day and increase CHO intake to 70% of your total energy intake. Rest the day before the event and keep CHO intake at 70%.

CHO for Strength Training

CHO are required for strength training because the exercises rely on muscle glycogen stores for energy. The recommended CHO intake is:

55-60% of your total daily caloric intake.

This is slightly lower than the requirements for endurance activities (see [Worksheet 11-1](#)) because the total amount of energy expended is less. CHO loading is not recommended for strength training because it causes extra water to be stored in the muscle.

Protein Needs

Protein needs of strength athletes and endurance athletes are quite similar at:

0.6 - 0.8 grams of proteins per pound of body weight.

This corresponds roughly to 10-15% of your total daily kcals. It is highly likely that your diet provides adequate proteins since most Americans consume proteins in excess of their needs. Use [Worksheet 11-2](#) or [Worksheet 2-2 \(Chapter 2\)](#) to determine your protein needs.



Worksheet 11-2. Calculate Your Protein Needs

Body Weight = _____ lbs.

0.6 grams/lb x _____ lbs. = _____ grams proteins.
(Body weight)

0.8 grams/lb x _____ lbs. = _____ grams proteins.
(Body weight)

Your daily protein grams = _____ to _____.

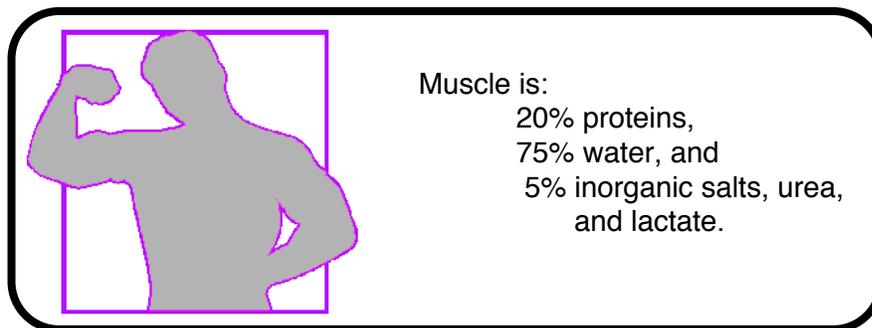
The High-Protein Myth

One of the most common myths is that eating high-protein diets and protein supplements leads to bigger muscles. Clearly, this is not the case! Muscle is only 20% proteins; the rest is water, minerals, lactic acid, and urea. (See [Figure 11-2](#).) Moreover, excessive protein intakes, mostly from protein supplements, can cause:

- ◆ More waste production.
- ◆ Increased water needs.
- ◆ Greater demands on the liver and the kidneys.
- ◆ Imbalances in the essential amino acids.
- ◆ Diarrhea or abdominal cramps.

For these very reasons, avoid protein powder drinks that provide excessive amounts of proteins or selected amino acids. Although heavily advertised and endorsed by celebrities, you do not need protein supplements to build muscle. Supplements can be very expensive, dangerous to your health, and they are quite unnecessary. Spend your money on a variety of foods for a balanced diet that will sufficiently meet your protein needs. Exercise to gain muscle!

Figure 11-2. Components of Muscle

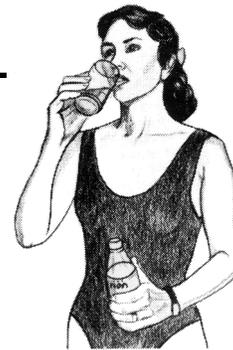


Vitamin and Mineral Needs

Any increased vitamin and mineral needs can be met by eating according to the Food Guide Pyramid ([Chapter 3, Figure 3-1](#)). Particularly, increase the number of fruits and vegetables you eat as these foods are good sources of many vitamins and minerals, as well as antioxidants. (See [Chapter 3 page 22, Table 2-2, Table 2-3, and Appendix A.](#)) These antioxidants may protect you from environmental stressors and may accelerate your recovery from exhaustive exercise. Fresh fruits and vegetables also provide potassium, which is lost during prolonged strenuous exercise (see [Table 2-3](#)).

Fluid Needs

Drinking fluids at regular intervals and eating foods with a high water content (i.e., fresh fruits) are important for maintaining hydration and fluid status during training. See [Chapter 2](#) for more information on fluid balance.



Getting Enough Fluids

- ◆ Drink 16 oz. (2 cups) of fluid two hours before starting exercise.
- ◆ Drink 3 to 4 oz. (1/2 cup) of fluid every 15-20 minutes during exercise.
- ◆ Weigh yourself before and after exercise to determine how much fluid you lost. Drink 16 oz. of fluid for every pound of weight lost.
- ◆ Do not rely on thirst as an indicator of fluid needs because it is not adequate. Once you feel thirsty you are already dehydrated.
- ◆ Drink water when exercising less than 60 minutes. Drink a sports drink (5% to 8% CHO with electrolytes) when exercising longer than 60 minutes.
- ◆ Monitor your urine: urine should be a pale yellow (unless you take vitamin B supplements) and you should be urinating frequently.

What to Drink

Many beverages can replenish lost fluids, so select a beverage that:

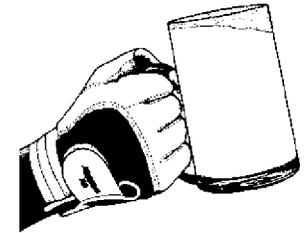
- ◆ Tastes good.



- ◆ Does not cause gastrointestinal or stomach discomfort.
- ◆ Is rapidly absorbed from your gut, especially when exercising.
- ◆ Contains electrolytes (see [Glossary](#)) and CHO (5% to 8%) when performing prolonged or strenuous exercise.
- ◆ Rehydrate with a non-caffeinated, non-carbonated, non-alcoholic beverage.

Overhydration

Although less common than dehydration, untreated overhydration can be life threatening. It is seen when plain water is used to replace fluid losses during prolonged (greater than 3 hours) strenuous exercise. Remember, water and electrolytes are lost during sweating, so both need to be replaced in this situation.



Overhydration decreases the concentration of electrolytes in the body, upsets metabolism and other bodily functions, and is just as harmful as dehydration. Prevent overhydration by drinking a beverage that contains electrolytes (such as a sport drink) or by eating a light snack (e.g., oranges) with your water. Between exercise sessions, electrolytes lost through sweating can be easily replenished by eating well-balanced meals and snacks ([Chapter 3](#)).

Nutrition for Exercise Recovery

Within 30 minutes of completing an extended or intense exercise session, consume at least **50 grams of CHO** (roughly 200 kcals). Also, continue to snack on high-CHO foods for up to six hours. This will help restore your muscle glycogen for the next exercise session. Some foods and servings sizes that contain roughly 50 grams of CHO are:

- | | |
|-------------------------------|-----------------------------------|
| ◆ Bagel with jam | ◆ Shredded wheat cereal, 1.4 cups |
| ◆ Baked potato with skin | ◆ Baked Beans, 1 cup |
| ◆ Cooked sweet corn, 1.5 cups | ◆ Bananas (2) |
| ◆ Cornflakes, 2.5 cups | ◆ Cooked oatmeal, 2 cups |
| ◆ Watermelon, 4.5 cups | ◆ Cooked Rice, 1 cup |
| ◆ Raisins, 0.4 cup | ◆ Orange juice, 2 cups |

For more information on the CHO content of foods, check food labels ([Figure 3-2](#)), check the USDA website at <http://www.usda.gov>, or ask a dietitian.