

# Chapter 5: Nutritional Considerations

# What is nutrition?

- The science of the substances that are found in food essential to life

# What makes a substance essential?

- If it must be supplied by the diet

# What are the six classes of nutrients?

- Carbohydrates
- Fats
- Proteins
- Vitamins
- Minerals
- Water

What are the three major roles nutrients are necessary for?

- Growth, repair, and maintenance of all tissues
- Regulation of body processes
- Production of energy

# What does nutrient density describe?

- Foods that supply adequate amounts of vitamins and minerals in relation to their caloric value

What is the body's most efficient source of energy?

- Carbohydrates

For the athlete, carbohydrate intake should account for what percentage of the total caloric intake?

- 55% to 70%

For the average person

- 50% to 60%

What are the two classifications of carbohydrates?

- Simple (sugars)
- Complex (starch and most forms of fiber)

The amount of sugar eaten should account for less than 15% of the total caloric intake, why?

- Sugar contributes little in the way for other nutrients

What is the most concentrated source of energy?

- Fat

What is the recommended intake of fat?

- Less than 30% of the total caloric intake

Of the total fat, what percentage should constitute saturated fat?

- Less than 10%

# What do proteins make up?

- The major structural components of the body

# What are proteins needed for?

- Growth
- Maintenance
- Repair of all body tissues
- Enzymes
- Many hormones
- Antibodies that help fight infection

The body prefers not to use much protein for energy, instead, what does it rely on?

- Fats and carbohydrates

What is the percentage of protein the body needs?

- 12% to 15%

# What are amino acids?

- The basic units that make up proteins

# How many amino acids are there?

- Twenty

Most of the amino acids can be produced in the body as needed. Others cannot and must be supplied by the diet. Amino acids that are obtained through food are called what?

- Essential amino acids

In order to support growth, repair, and maintenance, how must the essential amino acids be available?

- In proper proportion

Most of the proteins from animal foods contain all the essential amino acids that humans require and are called what?

- Complete (or high quality) proteins

Sources of protein that do not contain all the essential amino acids are usually from plant sources of food and are called what?

- Incomplete protein

How much protein is needed by an athlete developing muscle in a training program?

- 1 to 1.5 grams of extra protein per kilogram (0.5 to 0.7 grams per pound) of body weight every day. The range goes from slightly above to about double the protein RDA (0.8 grams per kilogram of desirable body weight)

# Why do athletes not need protein supplementation?

- Because their diets typically exceed even the most generous protein recommendations

Which nutrient is most essential and should be of greatest concern to the athlete?

- Water

Water is the most abundant nutrient of the body and accounts for what percentage of body weight?

- 60%

# What is water necessary for?

- All chemical processes that occur in the body
- Energy production
- Normal digestion of nutrients
- Temperature control
- Elimination of waste products of nutrient
- Body metabolism

Too little water leads to what?

- Dehydration

# What does severe dehydration lead to?

- Death

The average adult requires how much water per day?

- Minimum of 2.5 liters or
- 10 – eight ounce glasses (cups) or
- 80 ounces or
- 4 pints or
- 2 quarts or
- 1 gallon

Water is the only nutrient that is of greater importance to the athlete than to those people who are more sedentary, especially when the athlete is engaging in prolonged exercise carried out in a hot, humid environment. Such a situation may cause what?

- Excessive sweating and subsequent losses of large amounts of water

# What are the symptoms of dehydration?

- Fatigue
- Vomiting
- Nausea
- Exhaustion
- Fainting
- Possibly death

Replacing fluid after heavy sweating is far more important than replacing what?

- Electrolytes

# What are electrolytes?

- Electrically charged ions

## Which elements are the electrolytes?

- Sodium ( $\text{Na}^+$ )
- Chloride ( $\text{Cl}^-$ )
- Potassium ( $\text{K}^+$ )
- Magnesium ( $\text{Mg}^{++}$ )
- Calcium ( $\text{Ca}^{++}$ )

# What is the function of electrolytes?

- To maintain the balance of water outside the cell

What is an effective and inexpensive means of fluid replacement for most types of exercise?

- Water

Why may commercial drinks, rather than adequately hydrating the athlete, may in fact hinder water absorption?

- Because of their high sugar content

What may happen when an athlete consumes drinks containing too much glucose, fructose, or sucrose?

- They are hypertonic and may draw water from the blood plasma into the intestinal tract, dehydrating the athlete even more.

When should an athlete use commercial sports drinks that provide electrolytes?

- When the athlete is engaging in events such as ultramarathons

Why should a stronger electrolyte solution be used during cold weather rather than hot weather?

- It allows a slower, more steady release of fluid from the stomach

# What is not an indicator of hydration?

- Thirst

# What is glycogen super-compensation?

- Maximizing the amount of glycogen that can be stored (carbo-loading)

How is glycogen super-compensation accomplished?

- Over a six-day period divided into three phases

# How many days is phase 1?

- Days 1 and 2

What should happen with the training during phase 1?

- Hard

What should happen to carbohydrate intake during phase 1?

- Restrict

How many days is phase 2?

- Days 3 through 5

What should happen with the training during phase 2?

- Cut back

What should happen to carbohydrate intake during phase 2?

- Plenty of carbohydrates

How many days is phase 3?

- Day 6

What should happen with the training during phase 3?

- Competition

What should happen to carbohydrate intake during phase 3?

- Normal

How many times a year should glycogen super-compensation be done?

- No more than three times

When is glycogen super-compensation of value?

- In long duration events that produce glycogen depletion, such as a marathon