Outline

Structure & Function

Vegetarianism

Needs

Needs of exercisers

Dietary Protein

Protein is an essential nutrient

Structural basis for many of body tissues

Forms enzymes and hormones

Components for immune system

Energy (if inadequate CHO)

Implications for sports

Protein needs of strength and endurance exercisers

What is protein?

Animal and plant protein

Animal

Complete

Essential

Soy is an exception

Plant

Incomplete

Vegetarianism

Vegan

Ovovegetarian

Lactovegetarian

Ovolactovegetarian

Pescovegetarian

Flexitarian

Nutritional concerns with a vegetarian diet

Inadequate Calories

May be a problem for children and athletes

May be advantage for weight control

Lacks B12

Lacks Fe-, Ca+, Zn

Protein

Vegan diet should contain *complementary proteins*

Is a vegetarian diet more health-promoting than a non-vegetarian diet?

Nutrient dense

Low fat and cholesterol

High fiber

Low calorie

High vitamin & phytonutrient

High antioxidants

Protein RDA

Metabolism and Function of Protein

Protein: broken down into polypeptides individual AA in stomach and small intestine

Amino acids: absorbed and transported to liver

Liver: center of amino acid metabolism; continually synthesizes a balanced amino acid mixture for body's protein requirements

Amino acids: secreted into blood

Cells: obtain amino acids to synthesize proteins specific to cell needs

Figure 6.5

Proteins and Exercise

Protein use for energy during exercise when CHO stores decrease

Protein losses

> 4 gm lost in urine & sweat

Effect of training on protein metabolism: specific cell adaptations to chronic exposure

Resistance or strength training

Aerobic training

**Protein needs: Strength-type activities**

ACSM, AND & Dietitians of Canada

Recommend about 0.7-0.9 g/lb (1.6 to 2.0 grams/kg body weight)

More than the RDA b/c they need to build tissue

Increased when combined with adolescence

**Protein needs: Endurance-type activities**

Recommend 0.5-0.9 g/lb (1.1-2.0 grams/kg)

More than RDA because:

Promote synthesis of oxidative enzymes and mitochondria

Restore protein used for energy particularly when CHO run low

Higher end for:

 intermittent sports

dieting

Protein consumption for athletes

Consume protein, preferably with carbohydrate, before and after workouts:

Little difference in anabolic responses if protein is consumed either before or after exercise

The protein source should contain all essential amino acids

About 20-25 g protein

Or 0.05-0.13 g protein/lb body weight (0.1-0.3 gram/kg)