Sports Nutrition
The Role of Protein

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Sports Medicine

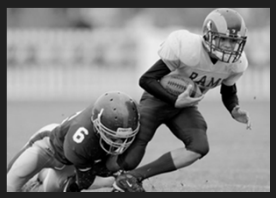
Agenda

- Protein Requirements
- Ensuring Adequate Protein
- The role of supplements
- Recovery protein
- Other elements of muscle building

Sports Medicine

13 yo football player

- 155 cm (5'1"), 55 kg (115 lb)
- Dad wants him to gain muscle
- Teammates more muscular
- Wants recommendation for protein supplement



Factors Involved in Muscle Building

- Genetics
- Testosterone
- Protein
- Calories
- Exercise Stimulus

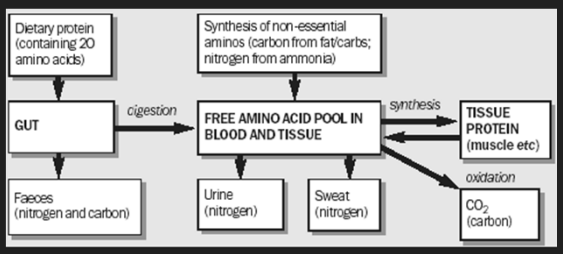
Amino Acids, Protein, & Muscle

- Proteins are made from building blocks called amino acids (AA's)
- Branched chain amino acids (leucine, isoleucine, valine)

Protein Function

- Make up 45% of total body weight
- Make up enzymes, hormones, hemoglobin, myoglobin, most other structures including, of course, muscle
- Function as a source of energy when body is in state of starvation or undergoing intense exercise
- Proteins in the body, such as muscle, are broken down during this state (catabolism) to produce energy

Protein Metabolism



Misleading Advertising

- *"Aminoprime* converts 100% of dietary proteins into muscle building amino acids"
- *"Aminoprime* amplifies the digestion and synthesis of high protein meals"

Protein Necessary for Muscle Building

- Protein requirement for children, teens, young adults 0.8-1.2 gm/kg/d
- Protein requirements for strength athletes are no greater than 1.8 – 2.0 gm/kg. Few studies demonstrate greater needs in body builders
- Meal protein balance is key along with recovery protein

Case #1 - Is Diet Enough?

- Let's say your son weighs 55 kg (about 115 lb). In order to get 2 gm of protein per kilogram body weight, he would need to eat about 110 mg of protein.
- Chances are he's getting all the protein he needs just by eating a typical American diet.

60 kg Athlete

Breakfast	Bacon & egg taco, banana, 8 oz milk	19 gm 8 gm
Lunch	Grilled chicken sandwich, fries, apple, 8 oz milk	27 gm 8 gm
Snack	Peanut butter & jelly sandwich, ice tea	4 gm
Dinner	2 pork chops Broccoli, baked beans 8 oz milk	48 gm 7 gm 8 gm
Dessert	½ cup ice cream	2 gm
	TOTAL DAILY PROTEIN	131 gm

Protein Requirements

- HS athlete, endurance – 1.2-1.4
- HS athlete, power – 1.6-1.8
- Adult endurance athlete, low intensity – 0.8-1.0
- Adult endurance athlete, high intensity – 1.2-1.4
- Master's athlete – 0.8-1.0

Protein Timing

- Protein distribution is important
- Physiological need dictates protein at EVERY meal
- Busy student athletes often miss breakfast

Diet versus Supplements

- Supplements can never COMPLETELY replace basic good nutrition
- Some supplements may contain harmful substances, + drug test
- Food is 100% legal
- Why waste the $$?

Recovery Protein

- Both whey & casein protein after exercise have resulted in similar net gains in muscle protein
- Protein should be ingested < 2 hours following resistance exercise
- Minimum 6-10 gm

Case #2 – College Baseball Player

- Unable to gain muscle mass
- Lifting weights 5 days per week
- Drinking protein shakes
- Also working 16 hrs/wk

Other Factors Influencing Anabolism (muscle building)

- Adequate calories
  - -Total caloric intake must be adequate to make use of protein for anabolism rather than energy production
- Recovery – inadequate rest
- Stress – stress hormones (cortisol, epinephrine) are catabolic
- Emphasize both eccentric & concentric training

Key Points

- Protein requirements vary by age & exercise intensity
- Maximum 2 gm/kg/d
- Protein must be ingested at EVERY meal, including within 2 hrs of exercise
- Other factors affect muscle building
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