Protein Timing & Training: Separating Fact from Fiction

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A. Structure & Function of Proteins
    a. Proteins are composed of amino acids
        i. Essential are amino acids that must be consumed in the diet
        ii. non-essential can be made by the body.
    b. Contractile Proteins: facilitate the contraction and relaxation of muscles.
    c. Defensive Proteins: protect the body from viruses (ex. fibrinogen and thrombin)
    d. Enzymatic Proteins: start chemical reactions in the stomach and the intestines.
    e. Hormonal Proteins: Messengers that influence a metabolic function in the body (ex – insulin).
    f. Storage Proteins: store essential minerals and energy for later use.
    g. Structural proteins: provide structure and support throughout the body (ex. Collagen)

B. Sources of Proteins
    a. animal sources
        i. **Whey Protein** is an complete animal based protein from cow's milk.
        ii. **Casein Protein**, like whey, is a complete milk-based protein. It makes up 80% of the protein in cow's milk and more abundant that whey.
    b. plant sources
        i. **Soy Protein** is a complete plant-based protein originating from the soybean plant. Soy is a great protein source for vegan or lactose intolerant individuals
    c. supplements

C. Review of the Research on Protein Consumption & Performance
    a. Impact on endurance and resistance training performance
        i. Protein does not appear to improve endurance performance when adequate carbohydrate is delivered. Adding protein during or after an intensive bout of endurance exercise may suppress myofibrillar damage and reduce feelings of muscle soreness. Research is limited.
        ii. Both men and women can receive a small to modest impact on strength development from protein supplementation. Protein supplementation of 15 – 25 g over 4-to-12 weeks exerts a positive impact on performance.
        iii. c. effect on physical performance measures
    b. Improvement in performance, body composition

D. Review of Specific Recommendations on Nutrient Timing in Healthy Adults
    a. An acute exercise stimulus and protein ingestion both stimulate muscle protein synthesis (MPS) before or after resistance exercise.
    b. mixed recommendations, but generally 0.25 g of a high-quality protein per kg of body weight, or an absolute dose of 20–40 g.
    c. Rapidly digested proteins that contain high proportions of essential amino acids (EAAs) and adequate leucine, are most effective in stimulating MPS.
    d. 1.4 – 2.0 g/kg/d is sufficient for most
    e. strive for 700 – 3000 mg of leucine and balanced EAAs

f. evenly distributed every 3-4 hours, across the day
g. optimal time diminishes as post-workout time increases
h. focus on whole food sources with all EAA to stimulate MPS

E. 7. Practical Strategies for Optimal Protein Timing

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