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SKELETAL MUSCLE HYPERTROPHY: EFFECTS OF NUTRITION AND RESISTANCE TRAINING IN NOVICE TRAINERS OF NORTH TRIPURA, INDIA

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Abstract:

Skeletal muscle hypertrophy is a crucial adaptation for athletes and individuals seeking improved body composition and strength. Resistance training is the most effective stimulus for muscle hypertrophy, and its effects can be enhanced by proper nutrition, particularly protein intake. This research aims to examine the interaction between nutrition and exercise, evaluating the impact of protein type and timing on muscle growth in novice trainers of North Tripura, India.

Keywords: Muscle hypertrophy, Nutrition, Protein intake, Resistance Training

1. INTRODUCTION

Skeletal muscle hypertrophy, defined as an increase in muscle size, is a key goal for athletes and fitness enthusiasts. Resistance exercise is the primary stimulus for hypertrophy, and protein intake plays a significant role in optimizing muscle growth. Studies have explored how different protein sources and their timing affect hypertrophy, providing insights into effective training and dietary strategies. This study focuses on novice trainers of North Tripura, India, to assess the regional implications of these factors.

Purpose of the Study The objective of this study is to analyze whether past research provides conclusive evidence regarding the effects of protein type and timing on muscle hypertrophy in individuals engaged in resistance weight training, particularly among novice trainers in North Tripura, India.

Hypothesis It is hypothesized that beginner weight trainers in North Tripura, India, who rely on raw food sources rather than supplements will experience sustainable muscle growth. The use of supplements at an early stage may lead to muscle loss upon discontinuation.

Delimitations

- Beginner weight trainers in North Tripura should avoid heavy supplementation or steroid use due to potential health risks.
- A balanced diet including both vegetarian and non-vegetarian protein sources is recommended.

Limitations

- The study focuses on novice weight trainers in North Tripura following a diet of raw protein sources such as boiled chicken, egg whites, fish, milk, cheese, nuts, and green vegetables.
- Estimated protein intake for a novice trainer weighing 77 kg is 154 g/day, derived from various sources:
 - Chicken breast (200 g) – 62 g protein
 - Egg whites (4) – 14.5 g protein
 - Fish (100 g) – 22 g protein
 - Cheese (100 g) – 25 g protein
 - Nuts (100 g) – 20 g protein
 - Almonds (4) – 6 g protein
 - Bananas (4) – 5.2 g protein

Terminology

- **Protein Ingestion:** The consumption of protein, particularly around exercise sessions, to enhance muscle growth.
- **Hypertrophy:** The process of increasing muscle size through resistance training.
- **Novice Lifter:** A beginner in resistance training capable of rapid progress in strength and muscle development.

Significance of the Study This study aims to evaluate whether the type and timing of protein intake significantly impact muscle hypertrophy among individuals engaged in resistance weight training in North Tripura, India.

Review of Literature Previous studies have investigated optimal nutrition strategies for maximizing muscle hypertrophy. Research has focused on the type, timing (pre/post-workout), and quantity of protein intake. Common protein sources analyzed include whey, casein, milk, soy, and essential amino acids. Studies indicate that protein intake around the workout period can enhance post-exercise strength and hypertrophy adaptations (Aragon & Schoenfeld, 2013).

Methodology

- **Inclusion Criteria:** Randomized controlled trials (RCTs) or randomized crossover trials focusing on protein timing.
- **Definition of Protein Timing:** Consumption of at least 6 g of essential amino acids (EAAs) within 1 hour pre/post-exercise.
- **Resistance Training Protocols:** Minimum 6-week duration, measuring muscle strength and hypertrophy.

Background: Protein timing is a strategy aimed at optimizing post-exercise muscle adaptations. Studies suggest that consuming protein immediately pre/post-workout enhances hypertrophy (Borsheim et al., 2002). However, conflicting research results indicate the need for further meta-analysis to clarify its effectiveness (Cermak et al., 2012).

Result Analysis

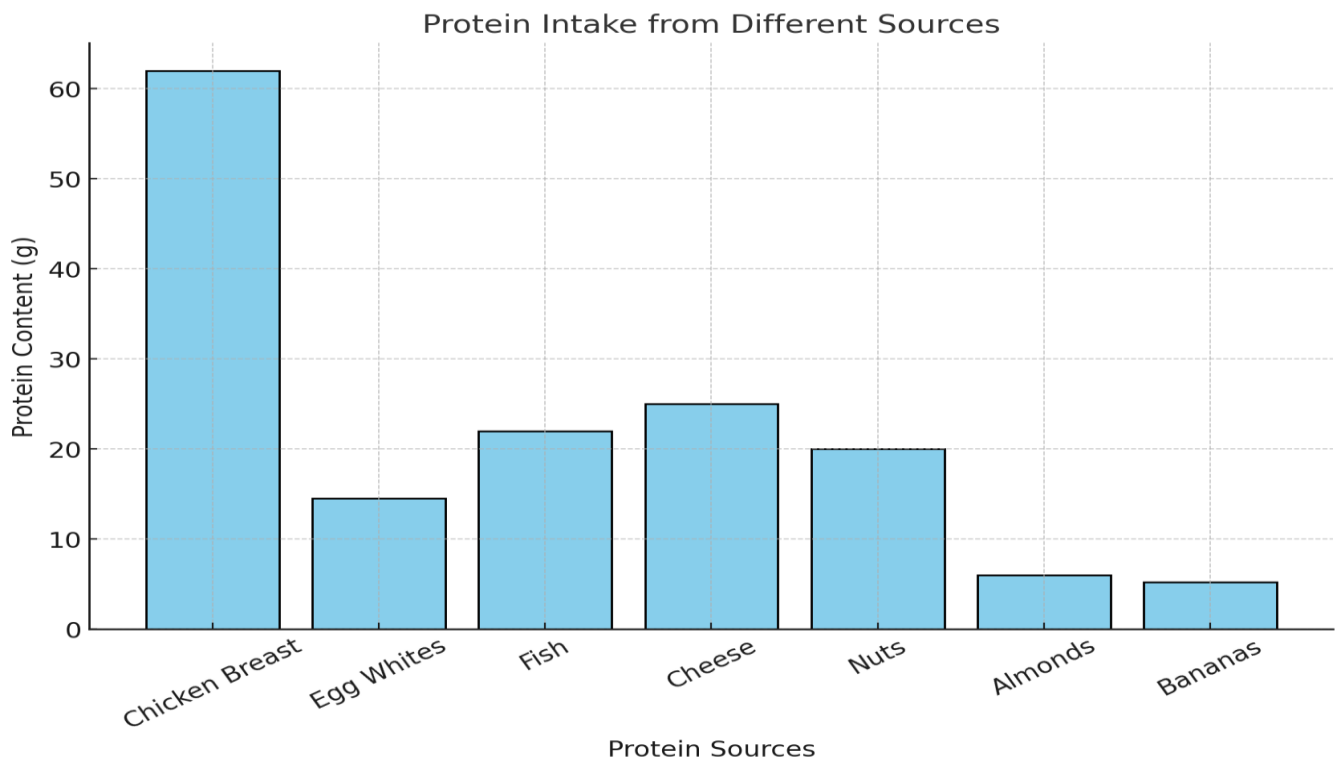
Analysis of Variance (ANOVA) was conducted to assess protein supplementation effects on beginner weight trainers in North Tripura:

Sources of Variation	df	SS	MSS	F-Value
Treatment	2	3.2	1.6	2.2
Error	27	19.6	7.2	

Findings indicate no significant differences between groups consuming protein supplements, though Group C exhibited greater biceps growth (mean value = 12.6).

Here is a bar graph representing the protein intake from different sources for a novice weight trainer of North Tripura weighing 77 kg:

- **X-axis:** Protein sources
- **Y-axis:** Protein content (g)



Here is a bar graph showing the protein content from different sources for a novice weight trainer of North Tripura, India.

Effect of Training: Training protocols significantly impact strength and hypertrophy. Research suggests that optimal hypertrophy-focused training should span at least 10–12 weeks, involving three to five sessions per week with compound exercises (Schoenfeld, 2010).

Summary

1. The study compares biceps thickness among three groups of novice weight trainers in North Tripura, India.
2. Methodology includes ten beginners from three different gyms in Dharmanagar, Tripura.
3. Participants are aged 18–35 years.
4. ANOVA results show no significant differences in muscle growth between groups, though Group C exhibited larger biceps.

Conclusion

Statistical analysis reveals no significant difference in biceps size among the three groups. However, Group C, which followed a specific meal plan, demonstrated superior biceps growth. These findings highlight the importance of consistent nutrition and training in muscle hypertrophy among novice trainers in North Tripura, India.

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