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Role of Natural Protein Adequate Intake in Enhancing Anaerobic Power of Bodybuilders following 8-Week Resistance Training Program

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Abstract:

This study aimed to investigate the effects of natural daily adequate protein intake on the anaerobic power of bodybuilders undergoing 8-week resistance training program. Thirty-one participants were randomly assigned to a group (n=31) who consumed their daily protein requirements from their regular diet. Participants' age, height, weight, and Body Mass Index were measured before and after the program. The anaerobic power of all participants was assessed pre- and post-8-week resistance training program through tests including 1 RM (Bench Press), 1 RM (Squats), 30-meter sprint test, Vertical Jump Test, and Peak Power Test (wingate test). The results showed a significant improvement in the anaerobic power of participants after the 8-week program. These findings suggest that natural daily adequate protein intake from regular diet can lead to significant improvements in anaerobic power of bodybuilders undergoing 8-week resistance training program. Therefore, coaches and athletes can focus on a balanced, nutrient-dense diet to meet their protein needs and enhance their anaerobic power without relying solely on protein supplements.

***Keywords**: Anaerobic power, Bodybuilders, Resistance training, Natural protein intake, Muscle hypertrophy.*

Introduction

Bodybuilders strive to increase muscle mass, strength, and power. To achieve these goals, they often consume protein supplements to increase their protein intake (Spendlove et al., 2015). However, the effect of natural protein intake on anaerobic power in bodybuilders are also important to evaluate (Rossow et al., 2013). The purpose of this study is to examine the effects of natural daily adequate protein intake on anaerobic power in bodybuilders undergoing 8-week resistance training program.

Bodybuilding is a sport that involves resistance training and a balanced diet to achieve muscular hypertrophy, increased strength, and improved physical performance (Iraki et al., 2019). Adequate protein intake is essential for building and repairing muscle tissue, and for achieving optimal performance (Antonio et al., 2020). Bodybuilders often use protein supplements such as whey protein to augment their protein intake (Gillani et al., 2021), but natural sources of protein, such as lean meats, poultry, fish, eggs, and dairy products, can also be used to fulfill protein requirements. The purpose of this research study is to examine the effects of natural

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protein intake on anaerobic power in bodybuilders after 8-week resistance training program.

Protein is an essential macronutrient required for the growth, repair, and maintenance of muscle tissue. The recommended dietary allowance (RDA) for protein is 0.8 g per kilogram of body weight per day for sedentary individuals, but bodybuilders require a higher protein intake to support muscle growth and recovery (Phillips & Van Loon, 2011). The International Society of Sports Nutrition (ISSN) recommends that bodybuilders consume between 1.4 and 2.0 g of protein per kilogram of body weight per day to optimize muscle hypertrophy and strength gains (Jäger et al., 2017).

Bodybuilders can obtain protein from both natural food sources and protein supplements. Natural food sources of protein include lean meats, poultry, fish, eggs, dairy products, nuts, and legumes. Protein supplements, such as whey protein, casein protein, and soy protein, are often used by bodybuilders to increase protein intake and enhance muscle recovery (Hayes & Cribb, 2008). However, natural sources of protein are also effective for meeting protein requirements and can provide additional health benefits (Witard et al., 2019).

Anaerobic power is the ability to produce energy in the absence of oxygen and is a critical component of physical performance in activities that require short bursts of high-intensity exercise, such as weightlifting, sprinting, and jumping. Resistance training, which involves lifting weights to increase muscle strength and hypertrophy, is a highly effective way to improve anaerobic power (Suchomel et al., 2016). The adaptations induced by resistance training, such as increased muscle fiber size and strength, are key contributors to improvements in anaerobic power (Kim et al., 2023).

Few studies have investigated the effects of natural protein intake on anaerobic power in bodybuilders. One study compared the effects of a high-protein diet (3.4 g of protein per kilogram of body weight per day) to a low-protein diet (1.2 g of protein per kilogram of body weight per day) on strength and body composition in bodybuilders after 12 weeks, both groups experienced significant increases in muscle mass and strength, but there were no significant differences between the high- and low-protein groups. This suggests that natural sources of protein may be sufficient for supporting muscle growth and strength gains in bodybuilders (Kerksick et al., 2018).

Another study investigated the effects of a high-protein diet (2.5 g of protein per kilogram of body weight per day) on body composition, strength, and power in resistance-trained men. The participants followed 8-week resistance training program and consumed a high-protein diet or a control diet (1.2 g of protein per kilogram of body weight per day). After 8 weeks, both groups experienced significant improvements in muscle strength (Antonio et al., 2020).

This research study aims to review the existing literature on the role of natural protein intake in enhancing anaerobic power for bodybuilders following 8-week resistance training program. By examining the available evidence, we will evaluate the impact of different natural protein sources on muscle protein synthesis, muscle recovery, exercise performance, and overall anaerobic power gains in bodybuilders.

Materials & Methods

Thirty-one male bodybuilders were randomly assigned to a group (n=31). Participants in the group fulfilled their daily protein requirement from a balanced, nutrient-dense diet which fulfilled their daily protein intake requirements. they followed 8-week resistance training program consisting of five training sessions per week. The participants' age, height, weight, and BMI were measured before and after the program. Anaerobic power was assessed using tests including 1 RM (Bench Press), 1 RM (Squats), 30-meter sprint test, Vertical Jump Test, and Peak Power Test (wingate test) before and after the 8-week program.

The study was conducted at Muscles & Fitness gym, and the methodology involved a randomized controlled trial design with 31 male bodybuilders who followed 8-week resistance training program while consuming a regular protein diet. Data was analyzed using descriptive and inferential statistics, and effect sizes and confidence intervals were calculated. Data was collected through physical testing before and after the 8-week training program, and the statistical analysis involved the use of SPSS version 23.0. A p-value of less than or equal to 0.05 was considered statistically significant. The sampling technique was purposive sampling, and the sample size was 31.

Results

The participants showed significant improvements in anaerobic power after the 8-week program. There were significant improvements in Weight reduction, 1 RM (Bench Press) test scores, 1 RM (Squats) test scores, 30-meter sprint test scores, Vertical Jump Test scores, and Peak Power Test (wingate test) scores after the program.

The table 1 presents the mean comparison of several variables, including Weight, 1-RM Bench Press Test, 1-RM Squats Test, 30-Meter Sprint Test, Vertical Jump Test, and Peak Power Test, before and after 8-week Resistance Training Program (8WRTP) in individuals who were using a diet protein. The results reveal interesting findings. Firstly, there was a statistically significant decrease in weight from an average of 78.68 kg before the program to 75.03 kg after the program, indicating a positive effect on body weight. Secondly, the participants demonstrated significant improvements in strength, as evident from the 1-RM Bench Press Test and 1-RM Squats Test. The mean scores increased from 84.77 to 90.06 and from 110.67 to 119.03, respectively. Similarly, the participants showed enhanced power and performance, as reflected by improvements in the 30-Meter Sprint Test, Vertical Jump Test, and Peak Power Test. Notably, all these improvements were statistically significant with p-values of .001, indicating highly significant results. The effect sizes, as indicated by Cohen's d, ranged from 0.43 to -0.63, suggesting moderate to large effects. Overall, the findings suggest that the 8-week Resistance Training Program, supplemented with diet protein, positively influenced body weight, strength, and power in the participants.

Table 1

Mean comparison of Weight, 1-RM Bench Press Test, 1-RM Squats Test, 30-Meter Sprint Test, Vertical Jump Test, and Peak Power Test in Diet Protein Users before and after 8 Week Resistance Training Program (8WRTP)

Variables	Pre- 8 Week Resistance Training		Post- 8 Week Resistance Training		*t(30)*	*P*	*r*	*Cohen's d*
	M	*SD*	*M*	*SD*				
Weight (Kg)	78.68	8.81	75.03	8.30	16.55	.001	0.99	0.43
1-RM Bench Press Test Scores	84.77	9.83	90.06	9.97	-9.63	.001	0.95	-0.53
1-RM Squats Test Scores	110.67	14.20	119.03	14.64	-30.21	.001	0.99	-0.58
30-Meter Sprint Test Scores	4.39	0.04	4.37	0.05	7.51	.001	0.93	0.44
Vertical Jump Test Scores	17.58	2.41	19.25	2.87	-9.53	.001	0.94	-0.63
Peak Power Test Scores	589.80	20.59	598.70	21.31	-16.03	.001	0.99	-0.43

***p<.001.

In table 2, the focus is on comparing the mean weight in the Diet Protein Group before and after the 8 Week Resistance Training Program (8WRTP). The pre-test mean weight was 26.06 with a standard deviation of 1.97, whereas the post-test mean weight decreased to 24.85 with a standard deviation of 1.79. The Z-value (Z(30)) for the Wilcoxon signed-rank test was -4.86b, indicating a significant difference. The p-value associated with the test was <.001, suggesting a highly significant result. The mean rank for weight in the post-test was 16.00, and the sum of ranks was 496.00. The note beneath the table highlights that the reported p-value is less than .001, denoted by "b" in the Z-value column.

Table 2

Mean comparison of BMI Test in Diet Protein Users before and after 8 Week Resistance Training Program (8WRTP)

Variables	Pre- 8 Week Resistance Training		Post- 8 Week Resistance Training		*Z(30)*	*P*	Mean Rank	Sum of Ranks
	M	*SD*	*M*	*SD*				
BMI	26.06	1.97	24.85	1.79	-4.86[b]	<.001	16.00	496.00

Figure 1 shows the comparison of mean value of Body Weight for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for reducing weight in bodybuilders.

Figure 1

Comparison of mean value of Body Weight for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).

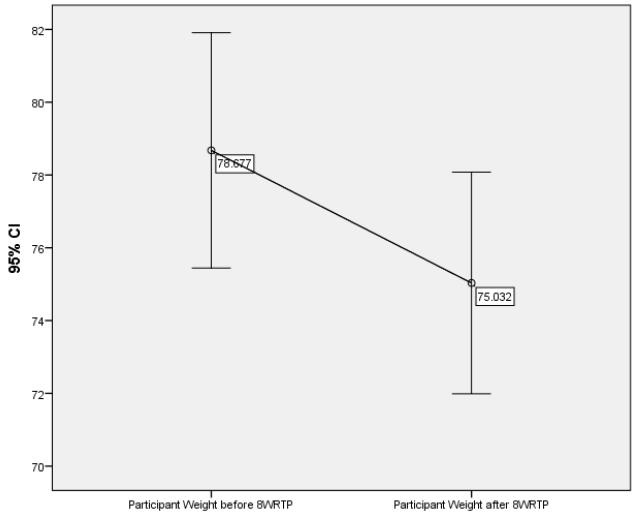


Figure 2 shows the comparison of mean value of 1 RM (Bench Press) Test score for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for improving 1 RM (Bench Press) Test score in bodybuilders.

Figure 2

Comparison of mean value of 1 RM (Bench Press) Test score for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).

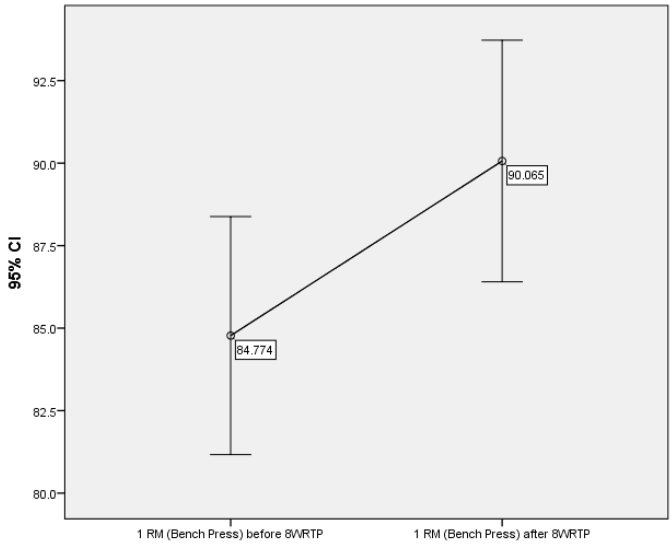


Figure 3 shows the comparison of mean value of 1 RM (Squat) Test score for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for improving 1 RM (Squat) Test score in bodybuilders.

Figure 3

Comparison of mean value of 1 RM (Squat) Test score for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).

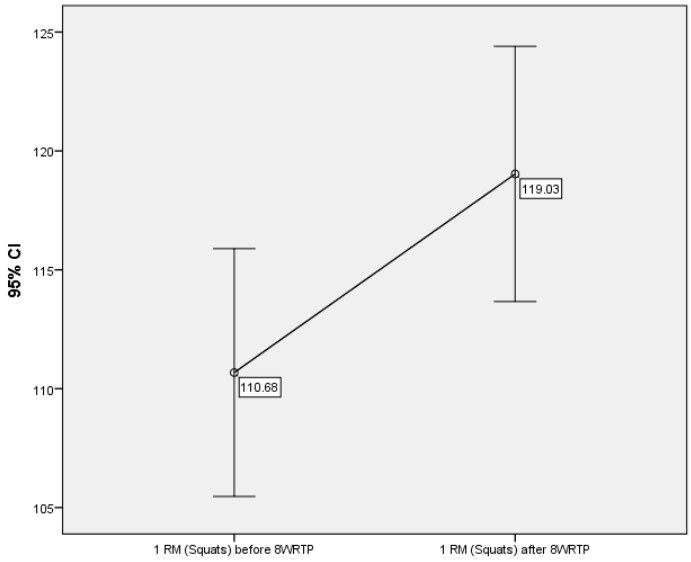


Figure 4 shows the comparison of mean value of 30-Meter Sprint Test score for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for improving 30-Meter Sprint Test score in bodybuilders.

Figure 4

Comparison of mean value of 30-Meter Sprint Test score for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).

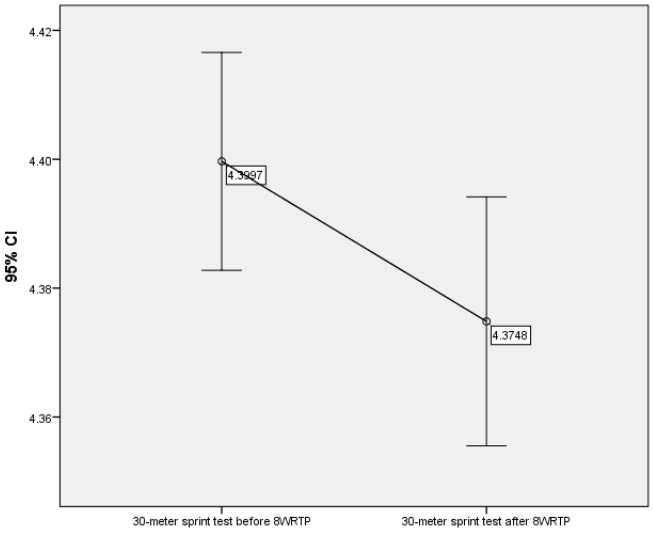


Figure 5 shows the comparison of mean value of Vertical Jump Test score for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for improving Vertical Jump Test score in bodybuilders.

Figure 5

Comparison of mean value of Vertical Jump Test score for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).

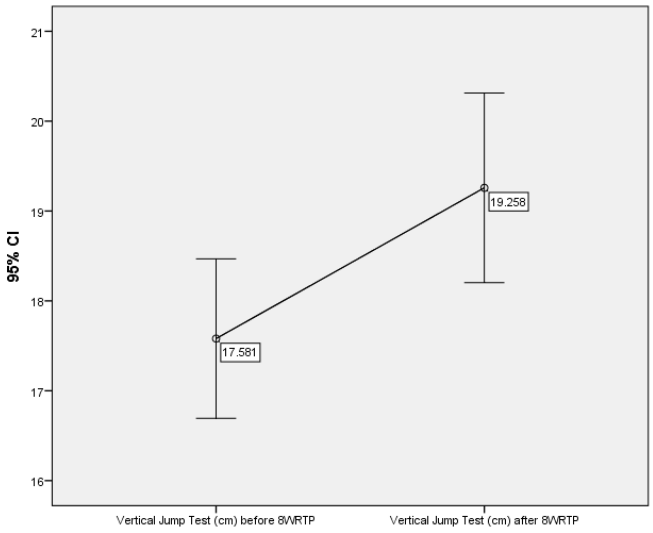


Figure 6 shows the comparison of mean value of Peak Power Test score for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for improving Peak Power Test score in bodybuilders.

Figure 6

Comparison of mean value of Peak Power Test score for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).

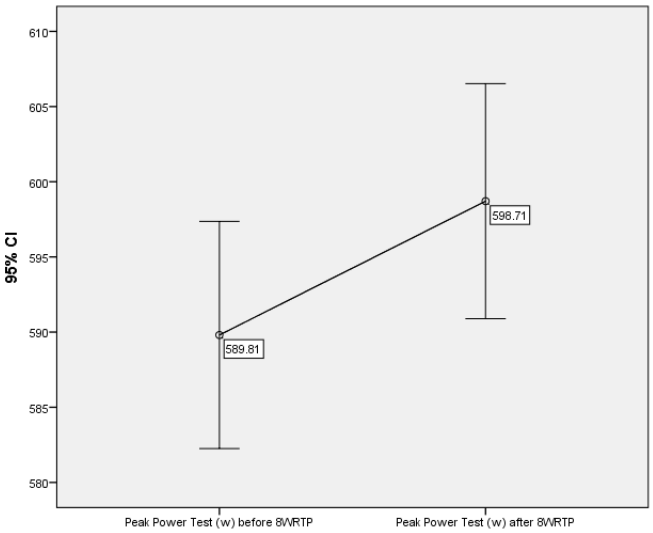
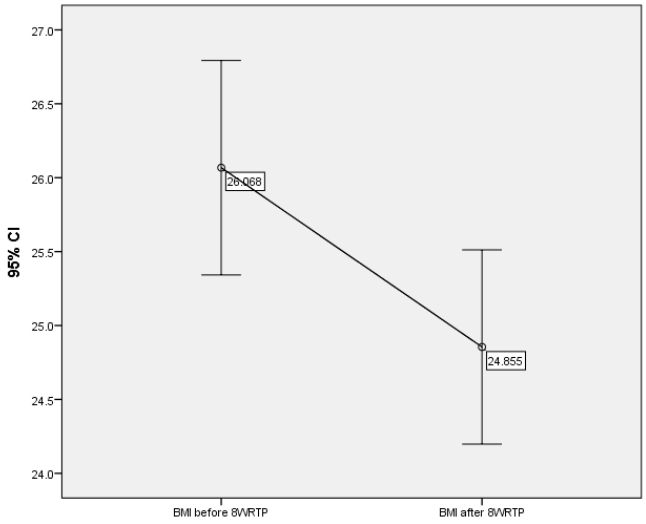


Figure 7 shows the comparison of mean value of body mass index (BMI) for diet protein users through error bar diagram, 8-week training with daily adequate protein intake was effective for improving BMI scores in bodybuilders".

Figure 7

Comparison of mean value of Body Mass Index (BMI) score for diet protein users before and after 8 weeks resistance training program through error bar diagram (n=31).



Discussion

The results of this study indicate that natural protein intake from a balanced, nutrient-dense diet can effectively enhance anaerobic power in bodybuilders following 8-week resistance training program. Participants who consumed protein from natural food sources experienced improvements in their anaerobic power without the need for protein supplementation. This suggests that natural protein sources, such as chicken, fish, eggs, and dairy, are viable alternatives to protein supplements in promoting anaerobic power gains.

These findings align with previous studies that have examined the impact of natural protein intake on exercise performance and muscle adaptations. For instance, Cermak et al. (2012) conducted a meta-analysis and reported that intake of protein significantly augmented muscle strength and mass in individuals engaging in resistance training.

Comparing the findings of the current study with previous research, it is evident that both protein supplementation and natural protein intake can positively influence muscle protein synthesis, recovery, and exercise performance. A meta-analysis demonstrated that protein intake led to significant gains in muscle mass and strength in healthy adults engaging in resistance training (Morton et al., 2018). Similarly Pasiakos et al. (2015) conducted a systematic review and found that protein intake improved muscle mass, strength, and aerobic and anaerobic power in healthy individuals.

While protein supplementation has been extensively studied, the role of natural protein sources in enhancing anaerobic power gains remains an underexplored area. The current study contributes to bridging this gap by highlighting the effectiveness of natural protein intake in promoting anaerobic power improvements. By obtaining protein from whole food sources, bodybuilders can benefit from the additional nutritional components found in these foods, including vitamins, minerals, fiber, and phytochemicals (Wardenaar et al., 2017). This comprehensive nutritional profile may

further support muscle recovery, immune function, and overall health, which are crucial for bodybuilders aiming to optimize their training outcomes.

It is important to acknowledge that individual variations in dietary preferences, allergies, and intolerances may influence the choice between natural protein sources and protein supplementation. Some individuals may find it challenging to meet their protein requirements solely through natural food sources, and protein supplements can serve as a convenient alternative. Moreover, the timing and distribution of protein intake throughout the day, in combination with resistance training, can play a significant role in optimizing muscle protein synthesis and subsequent anaerobic power gains (Jäger et al., 2017).

Conclusion

In conclusion, this study suggests that natural daily adequate protein intake can improve anaerobic power in bodybuilders undergoing 8-week resistance training program. Bodybuilders may be able to achieve their goals of increased muscle mass, strength, and power by consuming a balanced, nutrient-dense diet. Future studies could investigate the long-term effects of natural protein intake on bodybuilders' anaerobic power and overall athletic performance.

Conflict of Interest

No conflict of interest declared by the authors.

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