

# Significant Enhancement In the Rate of Body Mass and Lean Body Mass Gains with Bio-Gro™, a Bio-active Peptide Supplement, in Conjunction with Eight Weeks of Resistance training: A Prospective, Double-blind, Placebo Controlled Randomized Trial

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## ABSTRACT

**Background:** Previous research efforts have indicated that supplementation with a commercial food-based bio-active peptide product (Bio-Gro™) may reduce the amount of recovery time needed between repeated bouts of strenuous exercise and improve workout capacity. It has been suggested that enhanced workout capacity during workouts and improved recovery from exercise may enhance chronic training adaptations, such as enhance muscular strength, compared with training without supplementation.

**Methods:** This study utilized a prospective, randomized, double-blind, placebo-controlled research design. Twenty recreationally resistance trained men voluntarily participated in this study. Each research participant agreed to participate in four intense weight training sessions per week for four weeks and five intense weight training sessions per week for weeks five through eight over an eight week study period. Study participants were randomly assigned to receive either Bio-Gro™ or Placebo for the eight week period and were directed to take two servings per day. Test sessions were performed prior to initiation of the study and following the eight weeks of training. Body composition was assessed using the BodPod system, which

utilizes air displacement. Body composition was also calculated based on skinfold measurements that were taken at the chest, abdomen, thigh, triceps, and suprailliac. Circumferential measurements were taken at standard sites using a Gulick tape and included chest, shoulders, abdomen, mid-thigh, mid-arm relaxed, and mid-arm flexed. Pre- and post-study measurements were used to establish change scores which were compared between the Bio-Gro™ and Placebo groups using one way ANOVAs. Statistical significance was accepted at the  $p < 0.05$  level.

**Results:** Analyses revealed no significant differences between groups in baseline measures of body composition or circumferential measures ( $p$ 's  $> 0.05$ ). Analyses of change scores between groups indicated that Bio-Gro™ produced significantly greater ( $p < 0.05$ ) changes in total body mass as assessed with BodPod (+6.3 pounds) than the placebo condition (+2.8 pounds). Lean body mass changes were also significantly greater with Bio-Gro™ (+5.8 pounds) compared with Placebo (+3.7 pounds). ( $p < 0.05$ ).

While there were significant main effects of time detected for change scores of total body mass and lean body mass as calculated from the skinfold measurements, there were no significant group X time interactions indicating no significant differences in changes scores between groups.

Analyses of change scores between groups indicated that Bio-Gro™ produced significantly greater changes in mid-arm flexed measurements (+0.7 inches) than the placebo condition (+0.03 inches). ( $p < 0.05$ ) There were no other significant differences detected between groups in circumferential change scores.

**Conclusion:** The findings of this prospective, randomized, double-blind, placebo-controlled research investigation indicate that when applied in conjunction with an eight week intense resistance training program, Bio-Gro™ bio-active peptide supplement, produced significantly greater gains in total body mass (+6.3 lbs) compared with Placebo (+2.8lbs) ( $p < 0.05$ ); significantly greater gains in total body mass were 125% greater than Placebo; lean body mass gains (5.8lbs) were also significantly greater than observed with Placebo 3.7lbs). ( $p < 0.05$ ); and produced significantly greater changes in mid-arm flexed measurements (+0.7 inches) compared to the Placebo (+0.03 inches).

# **Safety and Organ Health with 8 Weeks Use of a Commercially Available Bio-active Peptide Supplement: A prospective, double-blind, placebo controlled randomized trial**

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## **ABSTRACT**

**Background:** It has been established that bio-active peptides may provide improved health, muscular performance, and immune function. Enhancements in athletic performance and gains in lean muscle mass have also been reported with training. While the safety of bio-active peptides has been previously reported, it was the purpose of this investigation to examine the specific effects of a commercial bio-active peptide product, Bio-Gro™, on blood markers of health and organ function and resting hemodynamic measures in men engaged in intense resistance training as indications of safety.

**Methods:** Twenty recreationally resistance trained men voluntarily participated in this prospective, randomized, double-blind, placebo-controlled research investigation. Study participants were randomly assigned to receive two servings of either Bio-Gro™ bio-active peptides or Placebo daily for an eight week study period. All study participants completed four intense weight training sessions weekly for the first four weeks and five intense weight training sessions performed per week for the final four weeks. Before and after the eight week program, assessment sessions were performed including standard complete blood counts, comprehensive metabolic panels, and resting hemodynamics. Measures were examined using two-way ANOVAs for repeated measures. Statistical significance was accepted at the  $p < 0.05$  level.

**Results:** Analyses of the blood chemistry count measures indicated significant main effects of group for RBC and significant main effects of time for values of MCV and MCHC ( $p$ 's  $< 0.05$ ). There were no statistically significant interaction effects (group X time) for any blood chemistry count measures indicating no specific effects of supplementation on these variables ( $p$ 's  $> 0.05$ ).

Results of the analyses of comprehensive metabolic panel measurements revealed significant effects of group for creatinine, eGFR, and BUN/creatinine ( $p$ 's  $< 0.05$ ). There were numerous significant main effects of time including BUN, BUN/creatinine, sodium, chloride, CO<sub>2</sub>, calcium, albumin, and alka phosphate ( $p$ 's  $< 0.05$ ). Analyses also showed no statistically significant interaction effects (group x time) for any comprehensive metabolic panel measures which indicated that Bio-Gro™ had not specific effects on the measures of the metabolic panels ( $p$ 's  $> 0.05$ ).

The analyses of resting hemodynamic measurements revealed significant time effects for HR ( $p < 0.05$ ) with no significant effects of group or significant group x time interactions for HR, SBP, or DBP ( $p$ 's  $< 0.05$ ) again indicating that the supplementation had no specific effects on these variables.

**Conclusion:** The results of the present study indicate that 56 days ingestion of a commercial bio-active peptide supplement, Bio-Gro™, produced no significant effects on complete blood count measures, values from comprehensive metabolic panels, or on resting hemodynamic measures in men participating in intense resistance training. These findings indicate that short-term supplementation of this bio-active peptide product is safe in apparently healthy, recreationally trained men when ingested at recommended dosages.

# **Bio-Active Peptides (Bio-Gro™) Enhances Contralateral Strength And Power Following Unilateral Resistance Training on Non- Dominant, Untrained Body Part**

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**Background:** Unilateral resistance training has been shown to increase the strength and power of the untrained contralateral limb. Supplementation with milk-based proteins (whey, casein and colostrum) has been shown to increase the strength gains from a resistance training program. Previous work has determined the effectiveness of whey protein during unilateral resistance training, but not the efficacy of colostrum supplementation. The purpose of this study was to examine the effects of colostrum extract supplementation (“Bioactive Peptides”, or BAPs) on the strength and power of the untrained leg following lower body unilateral resistance training.

**Methods:** Eighteen previously untrained men were randomly placed into either a colostrum extract group (BAP: n=9, 21.7±2.5y, 83.3±27.6kg, 180.1±6.6cm) or placebo group (PLA: n=9, 22.9±3.1y, 76.8±14.4kg, 174.1±8.2cm). Both groups completed lower body unilateral resistance training three days per week for four weeks. The training program consisted of unilateral jumps, leg press and leg extension as well as bilateral chest press and low row. All unilateral lower body training was completed on the dominant leg and testing was conducted on the nondominant untrained leg. Throughout the training period the BAP group consumed three grams of colostrum extract each day. The PLA groups consumed a non-nutritive iso-volumetric placebo. On training days, each group consumed their respective supplement immediately after training. On non-training days, participants consumed their supplement *ad libitum*. Unilateral leg press strength (LP), leg extension strength (LE), and mean jump power (MP) in the untrained leg were assessed before and after the training period. Data were analyzed using analysis of covariance (ANCOVA) controlling for baseline values. Significance was set at an alpha level of  $p=0.05$ .

**Results:** After controlling for baseline values, ANCOVA revealed a significant difference between the BAP and PLA groups for LE ( $p=0.02$ ) and MP ( $p=0.05$ ). There was no significant difference between groups for LP ( $p=0.984$ ). The BAP group had a significantly higher LE (54.0kg vs 48.1kg, respectively) and MP (792.6W vs 629.0W, respectively) than the CON group after completing the unilateral resistance training program.

**Conclusions:** The results of the study show that consuming Bioactive Peptides colostrum extract supplementation during four weeks of unilateral resistance training will significantly enhance the magnitude of strength and power gained in the untrained contralateral limb. Bioactive Peptides colostrum extract supplementation may be a useful supplement to augment the strength and power gains in the untrained musculature from a unilateral resistance training program.

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# A COMMERCIAL BIO-ACTIVE PEPTIDE DIETARY SUPPLEMENT INCREASES THE RATE OF STRENGTH DEVELOPMENT WITH EIGHT WEEKS OF RESISTANCE TRAINING IN WELL TRAINED MEN: A PROSPECTIVE DOUBLE-BLIND, PLACEBO CONTROLLED RANDOMIZED TRIAL

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## ABSTRACT

**BACKGROUND:** Previous research efforts have indicated that supplementation with a commercial food-based bio-active peptide product may reduce the amount of recovery time needed between repeated bouts of strenuous exercise and improve workout capacity. It has been suggested that enhanced workout capacity during workouts and improved recovery from exercise may enhance chronic training adaptations, such as enhance muscular strength, compared with training without supplementation.

**PURPOSE:** The primary purpose of this investigation was to examine the effects of eight weeks of supplementation with a commercial bio-active peptide supplement on measures of muscular strength during a program of resistance training, performed with experienced weight trained men.

**METHODS:** Twenty men, with a mean age of  $25.5 \pm 3.8$  years and classified as recreationally active (training at least 3 sessions/week), voluntarily participated in this study. All subjects participated in four resistance training sessions per week over the eight week study period with all training sessions directly supervised by investigators. Participants were randomly assigned to one of two supplemental groups, Placebo (PL) or bio-active peptide product (BAP), in a double blind manner.

Supplements were provided in powder form and mixed with water in two daily doses. Prior to and following the eight week training period, participants underwent maximal strength testing (1RM) of upper and lower extremities, bench press and leg press, respectively. Change scores were determined based on pre- and post-training test values and compared between groups using one-way ANOVA.

**RESULTS:** Supplementation with BAP during eight weeks of intense resistance training produced significantly greater gains in both upper and lower extremity maximal strength compared with PL. The mean values of 1RM for bench press increased  $16.5 \pm 13.0$  pounds with BAP which was significantly greater than the  $4.0 \pm 11.5$  pound increase in maximal bench press exhibited by the PL group ( $p < 0.05$ ). The BAP group also displayed significantly greater gains in maximal leg press ( $118.0 \pm 68.9$  pounds) compared with a  $54.5 \pm 51.5$  pound mean increase with PL ( $p < 0.05$ ).

**CONCLUSIONS:** When applied in conjunction with a program of resistance training, dietary supplementation with a commercial bio-active peptide product produced significantly greater gains in upper (bench press) and lower extremity (leg press) maximal strength levels compared with training and a placebo

**PRACTICAL APPLICATION:** As maximal strength levels are known to be primary determinants of performance of many sports activities, these findings may have implications when participating in resistance training in a variety of settings. Strength and conditioning professionals should be aware that food based bio-active peptides appear to provide a supplementation option that may increase the rate of strength improvement of both upper and lower extremities with relatively intense resistance training.



# Bio-Active Peptides (Bio-Gro™) Supplementation Improves Work Capacity During Short-term Resistance Exercise in Men

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## ABSTRACT

**BACKGROUND:** Inadequate recovery between training sessions leads to fatigue and imposes a hindrance on exercise performance. Bio-Active Peptides (BAPs) supplementation has been shown to reduce recovery time between strenuous exercise bouts and improve work capacity during subsequent bouts in athletes. However, few investigations have explored the efficacy of BAP supplementation on early performance adaptations in previously untrained men.

**METHODS:** Maximal dynamic strength (kg) of leg press (LP), leg extension (LE), chest press (CP), and low row (LR) exercises was assessed of eighteen untrained men ( $22.3 \pm 2.8y$ ;  $25.3 \pm 5.5\text{kg}\cdot\text{m}^{-2}$ ). Lower body strength was assessed via one-repetition maximum (1RM) testing; upper body strength was estimated as [repetition weight/(1.0278-0.0278)(reps)]. Participants were randomized into either a training only group (RT) or training + BAP supplementation (COL) (3g/day for 28 days). All participants completed four weeks of training (3 days/week; 12 total sessions) wherein each exercise was performed at 80% 1RM for  $3 \times 8-10$  reps. Daily training volume was calculated as weight  $\times$  reps. Changes in daily training volume were analyzed using magnitude-based inferences, calculated from 90% confidence intervals.

**RESULTS:** Analyses revealed that BAP supplementation provided an 80.8% chance of increasing total training volume from Week 1 to Week 2 compared to the RT group. From Week 1 to Week 3, BAP supplementation had a 50.9% chance of increasing total training volume compared to the RT group. BAP supplementation provided a 60.7% and 54.0% chance of increasing total training volume from Week 1 to Week 4 and Week 2 to Week 3, respectively. From the first to last training sessions, BAP supplementation displayed a 90.9% chance of increasing total training volume compared to the RT group.

**CONCLUSION:** Untrained individuals are especially susceptible to fatigue and soreness following exercise and often warrant extended recovery time at the onset of a training program. The current results suggest that supplementing with BAPs during the early phase of a training program may aid in reducing the recovery time between bouts of strenuous exercise. By encouraging faster recovery, BAP supplementation [Bio-Gro™] may promote earlier adaptations to training (i.e., increased strength and training volume) as compared to training without supplementation.