CONCLUSIONS: Although the result suggests calcium intake was related to lower body muscle performance, in future experimental study should explore and control confounding variables to understand role of calcium intake on muscle performance in larger samples and in different sports.

Table 1. Participant's physical and muscle performance characteristics (n=70)

Variables	Mean ± SE
Age (yrs)	20.81 ± 0.19
Height (cm)	173.59 ± 1.23
Weight (kg)	79.88 ± 2.01
BMI (kg/m^2)	26.43 ± 0.52
Dietary Calcium Intake	1098.09 ± 72.05
Jump Height (inches)	20.72 ± 0.62
Time in Air (sec)	0.64 ± 0.01
Velocity (m/s)	1.34 ± 0.02
Power (watts)	1058.26 ± 36.18
Relative Power (watts/kg)	13.10 ± 0.20
Right Hand Grip Strength (kg)	52.73 ± 2.52
Left Hand Grip Strength (kg)	48.22 ± 2.26

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Comparing Bilateral Muscular Imbalance Ratios In The Upper Extremities

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(No relationships reported)

Muscular imbalances may increase the risk of injury and decrease physical performance. Conventional wisdom suggests dominant side musculature may be more developed owing to preferred usage. Quantifying muscle imbalance between non-dominant and dominant arms is facilitated by technology that permits the measurement of arm power output across a range of resistances.

PURPOSE: To compare power output achieved by the dominant and non-dominant arms under various load conditions.

METHODS: 18 females and 14 males (21.0 ± 2.3 years, 66.9 ± 4.3 inches, 168.3 ± 36.2 lbs) were enrolled into an optimal muscle loading program using Proteus (Proteus Motion, USA). Each subject performed the following ten movements: abduction, adduction, external rotation, internal rotation, biceps curl, triceps extension, horizontal push, horizontal row, vertical push, and vertical row. Each movement was repeated twice under four separate loads: 7lb, 14lb, 21lb, and 28lb. Maximum average power for each movement was recorded in watts for further analysis. A paired-samples t-test, under the 28lb condition, was used to determine the relationship between the mean power of all subjects' dominant versus non-dominant arms. Repeated measures ANOVA was run to then determine differences in mean powers.

RESULTS: Power achieved in all movements was similar (r values ranged from 0.723-0.954; $p<0.001$) at the 28 lb load. On average, an individual's dominant arm during abduction produced less power than the non-dominant arm (143.6 ± 63.5 watts compared to 127.7 ± 50.2; $p=0.050$). However, external rotation of the dominant arm tended to generate more than non-dominant arms ($p=0.053$). Correlation values close to 1.00 across all comparisons demonstrated the variance between arms was minimal. The results of the ANOVA showed no statistical differences between arms.

CONCLUSIONS: The current assumption that dominant limbs are capable of greater power may not be true in all planes and when tested with isotonic loads applied in three-dimensional space. Our subjects did not demonstrate power imbalances between dominant and non-dominant arms.

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The Effectiveness Of An Augmented Musculoskeletal Feedback System Compared To Traditional Core Stabilization Exercises

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PURPOSE: A prevailing health problem is low back pain (LBP). A common clinical strategy to treat LBP is the strengthening of key core stabilization muscles, the transverse abdominis (TrA) and lumbar multifidus (LM). The purpose of this study was to compare the effectiveness of using an augmented biofeedback device versus traditional core stabilization exercises at strengthening the TrA and LM in healthy participants.

METHODS: University students (41 females, 13 males), ages 18-25 years with no recent history of back injury and no history of back surgery were recruited. Participants were tested on the maximum voluntary contraction (MVC) of the TrA and LM at lumbar vertebrae levels L4 and L5 using wireless electromyography (EMG). Participants were split into two groups. The control group performed traditional core stabilization exercises, the experimental group used an augmented biofeedback device. Participants performed the exercises 3 times a week for 20 minutes. Participants returned after 8 weeks to retest the MVC.

RESULTS: Paired-sample t-tests revealed significant improvements for Left L4 ($t(52) = 2.08$, $p < .05$), Left L5 ($t(52) = 2.14$, $p < .05$), Right L4 ($t(52) = 2.34$, $p < .05$), and Right L5 ($t(52) = 2.41$, $p < .05$) over the course of the 8-week exercise period. To determine if improvements differed across exercise conditions, a series of analyses of covariance (ANCOVA) were used. In all analyses, change scores were entered as the dependent variable with pre-test MVC entered as covariates. Exercise condition was entered as the independent variable. Results of the analyses revealed no significant effect of exercise condition on change score for Left L4 ($F(1,51) = .47$, $p = .50$), Left L5 ($F(1,51) = 1.72$, $p = .20$), Right L4 ($F(1,51) = .01$, $p = .95$), Right L5 ($F(1,51) = .18$, $p = .68$), Left TrA ($F(1,51) = .03$, $p = .86$), or Right TrA ($F(1,51) = .00$, $p = .95$).

CONCLUSION: Results of the study found that MVC of the LM significantly improved in both groups. MVC of the TrA improved in both groups as well, however changes did not reach statistical significance. An augmented biofeedback device could be used as an alternative to traditional core stabilization exercises to strengthen the TrA and LM.

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COMPARISON OF MUSCLE ACTIVATION BETWEEN THE CONVENTIONAL, SUMO AND STIFF-LEG DEADLIFT

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(No relationships reported)

PURPOSE: The purpose of this study was to compare differences in muscle activation of the primary agonist muscles during three variations of deadlift - sumo (SDL), stiff-leg (SLDL), and conventional (DL) - in both men and women.