POWER PLATE®

Discover the Difference

Squatting on a Power Plate® machine also improves upper body strength

This is a summary of a study published in the Journal of Strength and Conditioning Research. Vol. 24(9), pp: 2506-2511. 2010.

By Pedro J. Marín, A.J. Herrero, N. Sáinz, M.R. Rhea, and D. García-López.
European University Miguel de Cervantes, Valladolid, Spain.

Study Conclusions:

- Vibrations transferred from the feet upwards through the body can improve muscular performance in the upper body.
- Performing triceps extensions, whilst in a squat position on a vibrating Power Plate® machine enhances both the number of triceps extensions able to be performed in a set time, and average movement velocity.

Introduction:

In recent years, research has investigated how Acceleration Training can offer various fitness and wellness improvements. Much of this work focused on the stimulation of the lower extremities created by the vibrations from the platform.
This study aimed to analyse the effects of different vibration settings on the upper body, even when the vibrations were being transferred via the feet upwards through the body. It investigated the number of repetitions able to be performed in a set time, mean velocity and perceived exertion during a set of elbow extension exercises.

Method:

Twenty students, all classed as recreationally active, participated in this study. Each participant performed elbow extensions on a pulley cable machine while standing in a half squat on the Power Plate machine (see figure 1). They performed the elbow extensions during three test sessions (one week apart from each other). Each of the test sessions were performed in one of the following conditions:

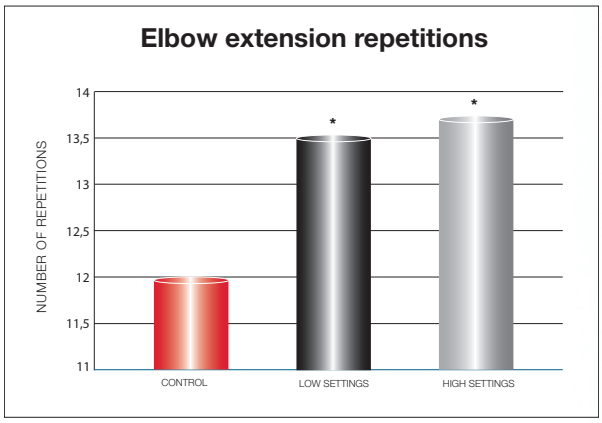
- High: Power Plate machine set at 50Hz and High amplitude
- Low: Power Plate machine set at 30Hz and Low amplitude
- Control: Power Plate machine turned off

The order of the condition applied for each test session was determined randomly.
During the test sessions the researchers measured the number of repetitions and the average velocity of the elbow extensions. After the fifth repetition the researchers asked the participants to rate their perceived exertion on a scale between 1 (extremely easy) to 10 (extremely hard).

Figure 1

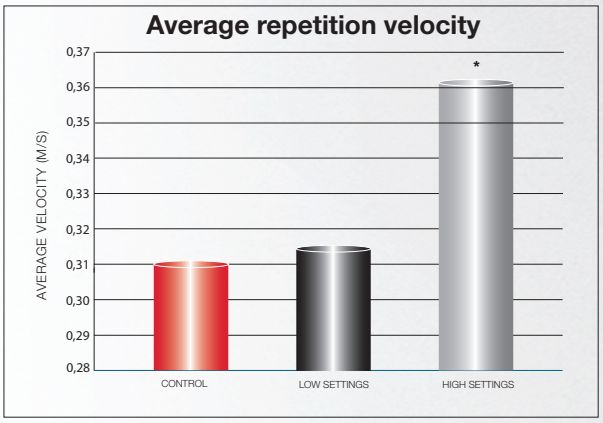
Squatting on a Power Plate® machine also improves upper body strength

POWER PLATE®
Discover the Difference



* Significant different from the control group

Figure 2



* Significant different from control and low setting condition

Figure 3

Results:
As illustrated in figure 2, the participants were able to perform significantly more repetitions in High and Low vibration conditions compared with the control condition. However, no significant difference was observed in repetitions between the High and Low setting.

Figure 3 shows that the High group performed the elbow extensions at a significantly higher average velocity compared with the Low and Control groups.

Conclusion:
This study shows that vibration via feet provides superimposed stimuli for elbow-extensors performance, as the number of repetitions were significant higher in the High and Low groups (14.2% and 12.5% respectively), compared with the control group.

The average velocity was only significantly higher in the High group (16.4%), which indicates that a higher setting on the Power Plate results in more neuromuscular facilitation than a lower setting.

The ability of the vibration to assist in increasing both repetitions and average velocity could be very important for several resistance training goals, as the total volume (repetitions) and kinematics (velocity) associated with resistance exercises have been proposed as important stimuli for strength and muscle power resistance training-induced adaptations.

Fitness professionals can employ high settings (50Hz, High) when using the Power Plate® machine, to improve muscle performance in the upper body. These findings expand the use and application of vibration for the upper body, as they indicate that improvements are possible even when specific upper body exercises are being performed without direct vibration exposure.