

**EFFECTS OF FREE WEIGHTS AND FREE WEIGHTS WITH ELASTIC BANDS ON POWER DEVELOPMENT DURING A BENCH PRESS**

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**KEY WORDS:** weight lift, elastic bands, power development

**INTRODUCTION:** The purpose of this study was to examine the effects of the use of elastic bands in addition to free weights on power development while performing a bench press at maximal speed.

**METHODS:** Eight healthy division AA football players from Indiana State University were tested for their 1 RM during a bench press after signing an informed consent. On 2 testing sessions with 3 days rest, the subjects performed bench presses for maximal speed that consisted of 3 trials of 2 repetitions with 45% of their 1RM load and on the other test day the subjects used a similar weight but elastic sport bands were attached to each end of the bar. A tension load cell was used to determine the elastic stiffness of the band and the elastic range of the bands. Videographic records were recorded at 60 Hz from a transverse view of the subject performing a bench press. Data point markers representing the body's lifting configuration were digitized, transformed using a 2D-DLT, and digitally smoothed at 10Hz.

**RESULTS & DISCUSSION:** The subjects' mean weight was 90.6±11.3kg, their mean bench press 1RM was 162.5±23.4kg and their testing weight which represented 45% of their 1RM was 75.6±9.9 kg. Statistically significant different mean vertical bar velocities of 115.6±15.3 for the free weight (FW) condition and 87.8±14.1 cm.s<sup>-1</sup> for the compensatory band method (CM) were found (p=.001) (Figure 1). The mean peak bar power for the FW condition during the bench press was 103.2±31.6W and the elastic band group was 113.9±33.5W (p=.13). Although not statistically different, the elastic band group averaged 9.5% more peak power per lift. Significant differences (p=.001) in the mean bar power existed with the FW group generating a mean power of 74.5±19.1W and the band group produced 92.3±23.6W during the accelerative phase of the lift. This indicated that the addition of bands to the free weight, increased the power generation by 19% during the accelerative phase of the lift. The decelerative phase of the lift revealed significantly greater (p=.02) mean power output 89.2±21.4W (29%) for the elastic band assisted lifts than the FW (63.4±23.6W) (Figure 2).

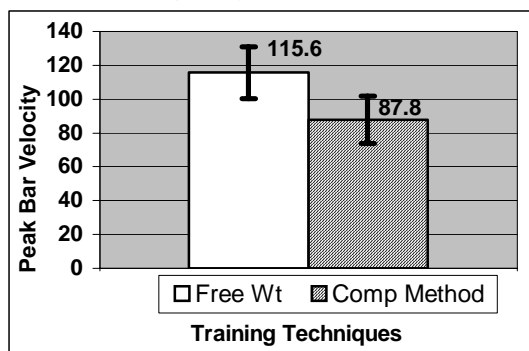


Figure 1: Peak Vertical Bar Velocity (cm\*s<sup>-1</sup>)

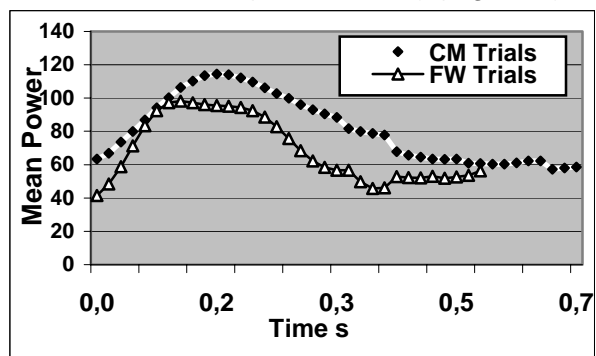


Figure 2: Mean Bar Power (W)

**CONCLUSIONS:** The use of the elastic bands produced increases in the peak power output 9.5%, 19% mean power output during the accelerative phase, and 29% mean power during the decelerative phase of the bench press which would be beneficial for athletes participating in throwing events where high terminal velocities with weighted objects are desired.