TACSM Abstract

Seasonal Shifts in Jumping Patterns: A Study of Countermovement Jump Strategies in High School Football Athletes

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ABSTRACT

Modern sporting trends have begun to adopt sport science and load monitoring to identify in-season trends with the goal of improving performance and reducing injury. Although these resources have become increasingly common in professional and collegiate sports, many high school athletic programs have yet to adopt such technologies. While previous research has demonstrated season-long changes in jump performance, no research has investigated the impact of in-season demands on the changes in jump strategy in male high school football athletes. **PURPOSE**: The purpose of this study was to examine changes in jump strategy in high school football players over a single football season. **METHODS**: Sixty-nine male high school football athletes, including 25 offensive skill, 23 linemen, 12 linebackers, 7 defensive backs, and 2 special teams players were tested for maximal jump performance at the beginning and end of a high school football season. Testing was conducted using three attempts of a maximal hands-on-hips countermovement jump on portable force plates, with the average of the three jumps used for analysis. A minimum of 10-weeks between sessions accounted for the time between pre- and post-testing. A dependent-samples t-test was performed to calculate differences between the two time points. **RESULTS**: Significant reductions were observed across all phases of the jump movement revealed significant differences from pre- to post- testing. The largest reduction was seen during the unweighting phase (0.40 to 0.36s), followed by braking phase (0.22 to 0.19s), and finally propulsive phase (0.30 to 0.28s). Resulting in a total time to takeoff decrease of 0.92 seconds to 0.83 seconds, resulting in an increase in mean jump height (14.15 to 14.89 inches). Jump strategy differences were also significantly different between time points for modified reactive strength index (0.40 to 0.47 and stiffness metrics (-4996.86 to -5622.46N/m). No differences were seen for countermovement depth ($t(68) = 0.44$, $p=0.663$) between the two time points. **CONCLUSION**: At the end of a competitive season, high school football athletes increased their speed at all phases of the jumping motion. Despite the increased speed during the movement, there were no changes in the countermovement depth prior to takeoff. Our research indicates that football athletes become faster and more efficient with their CMJ strategy to achieve increased performance as measured by Jump Height. Future studies may benefit from collecting follow-up data collection to examine the detraining effect that can occur post-competition, and to incorporate differences between double and single leg jumping strategy. Doing so has the potential to identify injury risk and asymmetries throughout the season.