

The Relationship between Energy Balance and Performance Measures in Collegiate Female Volleyball Players

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Purpose: The purpose of this study was to determine if there is a relationship between hourly and total energy balance (EB) and performance in collegiate volleyball players.

Methods: Eleven collegiate female volleyball players participated in this study. At the first visit, athletes were provided informed consent and instructed on completing 24-hour food and activity logs. During the second visit, the food and activity logs were collected and analyzed to determine hourly EB values. Performance was measured with a 10-yard sprint test and a vertical jump test using the Just Jump! Mat.

Results: Participants consumed 2799 kcal and expended 2665 kcal, with a distribution of 18% protein, 35% fat, and 47% carbohydrate. Average hourly energy balance was -132 kcal. Higher average EB was associated with greater vertical jump and decreased sprint time ($p=0.013$ and $p=0.009$, respectively). In addition, participants were divided into two groups based on whether their average hourly EB was in surplus ($n=7$) or deficit ($n=4$). The surplus group was found to have a higher vertical jump ($p=0.017$) and lower sprint time ($p=0.016$) than the deficit group.

Conclusions: This study indicates that an energy intake that supports a positive hourly energy balance is associated with improved performance measures. Future studies should test whether providing calories to those in a calorie deficit prior to activity improves performance outcomes.

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