Massey University
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The Effect of the Recovery Duration between Warm-up and Competition on Physiological and Psychological Markers in Well-Trained Football Players

Submitted by Terry O'Donnell to Massey University as a thesis for the degree of a Master of Science in Exercise and Sport Science (February, 2013)

I certify that all material in this dissertation which is not my own work has been identified and that no material is included which has been submitted for the granting of a degree by this or any other university institution.

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Abstract

Purpose: Football players at the elite level are required to cease warming up 20 minutes prior to matches commencing (Blatter & Linsi, 2003). Since a duration of 15-20 minutes may cause muscles cooling, this time period could be problematic for athletic performance (Bishop, 2003a). Therefore the aim of this research study was to investigate the effect of varied recovery durations post warm up on physiological, perceptual and performance measures of football players during the Loughborough Intermittent Shuttle Test (LIST).

Methods: Thirteen male football players completed five assessment sessions; a graded exercise test (GXT) to maximal functional capacity, a baseline assessment for athletic performance (sprint, agility and vertical jump), and three experimental trials. After completing a standard active warm up, the experimental trials required participants to passively recover for either 5, 10 or 20 minutes before performing assessments of sprinting, vertical jump and agility. Thereafter, participants completed a 90 minute intermittent shuttle protocol (LIST). Heart rate (HR), blood lactate (BLa), the feeling scale (FS), felt arousal scale (FAS) and rating of perceived exertion (RPE) were collected at regular intervals throughout the LIST. All subjects completed the test on 3 separate occasions under each recovery condition.

Results: Sprint performance following a 5 minute recovery was significantly slower than the baseline performance assessment (2.52 ± 0.12s *cf.* 2.43 ± .09s $P < 0.016$). Although both sprint and agility performance showed a trend towards being negatively affected by a 20 minute recovery duration ($P = 0.032$ and 0.031 respectively), participants vertical jump typically improved following only 10 minute recovery duration. Participants were less aroused and experienced lower levels of pleasure (FAS and FS) throughout testing following

the 20 minute recovery duration (1.50 ± 0.97 *cf.* 2.80 ± 1.14, and .50 ± 1.88 *cf. 3*.17 ± 1.33, $P < .05$). When investigating the physiological and perceptual response during the LIST, the recovery duration did not significantly influence participants' HR, BLa, RPE or performance response.

Conclusion: This study would suggest that a recovery period of 10 minutes post warm up may improve FAS, FS and VJ during exercise. However, ambiguous findings observed for BLa failed to provide physiological data to support these findings. The small sample size is the primary reason for these equivocal results. Future research should consider the effect of a larger sample size, inclusion of sport-specific skills and mechanisms for maintaining temperature during this interim period.

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