



GPS Based Time-Motion Analysis of A-League Soccer

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Statement of Originality

The thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to the final version of my thesis being made available worldwide when deposited in the University's Digital Repository, subject to the provisions of the Copyright Act 1968.*

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Abstract

This thesis investigated the time-motion (t-m) characteristics of Australian professional soccer players in match play competing in the Australian A-League using Global Positioning System (GPS) technology. The first aim of this study was to provide a whole match overview of Australian A-League players, including analysis of the different playing positions. The second aim was to study the t-m patterns of A-League players in smaller time periods (halves, 15 minute and 5 minute) to look for potential indicators of fatigue. Fifteen male soccer players (age: 24.9 ± 4.7 yr; body mass: 80.4 ± 7.3 kg; height: 183.5 ± 5.5 cm) playing in the Australian A-League volunteered to participate in the study. A total of 103 individual match files over 2 seasons were collected. Following strict exclusion criteria 67 full match files (16 central defenders [CD], 10 wide defenders [WD], 27 central midfielders [CM], 10 wide midfielders [WM] and 4 attackers [A]) were included in the analysis. The total distance (TD) covered in A-League matches was $10,857 \pm 1103$ m of which 2310 ± 627 was covered in high speed activity (HSA) at a speed of greater than $14.4 \text{ km}\cdot\text{h}^{-1}$. Whole match characteristics were very similar to other leagues from around the world. The positional analysis demonstrated that CD covered the smallest TD and HSA, while both groups of midfielders covered the greatest TD and HSA. TD declined from the first to second half, while HSA between halves did not show a significant difference. Our detailed t-m patterns in 15 and 5 min periods revealed a decline in TD and HSA throughout the A-League matches suggesting some end match fatigue. The A-League showed no decline in activity at the start of the second half, which is likely related to the warmer environmental conditions. The A-League players displayed a temporary drop in HSA after the most intense periods of the match. Besides finding no decline in activity at the start of the second half, our findings indicate that the A-League t-m patterns are similar to other leagues around the world. Future research in the Australian A-League should focus on tactical influences on t-m characteristics while playing in a hot environment, which also requires significant domestic travel and time zone changes.

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Abbreviations

A	Attackers
ANOVA	analysis of variance
ANSL	Australian National Soccer League (prior to 2005)
BFD	Brazilian First Division
CD	Central Defenders
CI	Confidence interval
CL	Champions League
CM	Central Midfielders
CV	Coefficient of Variance
cm	centimetres
D	Defenders
ECL	English Champions League (2 nd Division)
ENL	European National League
EPL	English Premier League
ES	Effect size
FL1	French League 1
GPS	Global Positioning System
HSA	High Speed Activity
Hz	Hertz
ISA	Italian Serie A
kg	kilograms
km·h ⁻¹	kilometres per hour
LSA	Low Speed Activity

M	Midfielders
m	metres
min	minutes
n	number
p	probability
s	seconds
SA	Selective Availability
SD	Standard Deviation
SLL	Spanish La Liga
TD	Total Distance
t-m	Time-Motion
VHSA	Very High Speed Activity
vs	versus
WD	Wide Defenders
WM	Wide Midfielders
yr	years