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# Match play demands of 11 versus 11 professional football using Global Positioning System Tracking: Variations across common playing formations

Running Head: Match play demands of football

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## Abstract

This study aimed to examine Global Positioning System (GPS) determined movement patterns across the 5 most common playing formations (4-4-2; 4-3-3; 3-5-2; 3-4-3; 4-2-3-1) employed in 11 versus 11 football match play in England. Elite male footballers (n = 46) were monitored over the course of a season; Total distance (TD), High speed running (HSR), High metabolic Load distance (HMLD), High speed accelerations (Acc) and decelerations (Dec) data was collected for analysis. It was found that 3-5-2 formation elicited higher TD (10528 ± 565m, p= 0.05), HSR (642 ± 215m, p= 0.001), and HMLD (2025 ± 304m, p= 0.001) than all other formations and above average Acc and Dec (34 ± 7, p= 0.036 and 57 ± 10, p= 0.006), with 4-2-3-1 eliciting the highest Acc and Dec (38 ± 8 and 61 ± 12). Positional data showed that CM in 4-3-3 covered >11% TD than in 4-4-2 (p= 0.012). FW in 3-5-2 covered >45% HSR than in 4-2-3-1 (p=0.004). CM in 4-3-3 covered >14% HMLD than in 4-4-2 (p=0.367). FW in 4-3-3 performed >49% accelerations than in 4-2-3-1 (p=0.293). WD in 3-5-2 performed >20% more decelerations than in 4-4-2 (p=0.161). This study is important for coaches understanding, that positional physical characteristics are influenced by the demands of playing in different formations during match play.

## Introduction

Within the game of football, laboratory and field based testing (Bangsbo et al., 2006; Le Gall et al., 2010) have been widely used as a means to understand the physiological and movement demands involved. To further this understanding, there has been an increased focus on in-game analysis and data collection (Buchheit et al., 2014). The technical and tactical nature of football has shown that the physical characteristics are multifactorial (Bradley et al., 2013) and that the physiological demands have changed as the nature of the game has further evolved (Barnes et al., 2014; Malone et al., 2015). There is a scarcity of research that has quantified directly the individual movement specific requirements and physiological demands involved in 11 versus 11 match play in football (Bradley et al., 2013). To date, there has been limited examination as to how different playing formations and positions alter the physiological and technical demands required (Dellal et al., 2012; Russell et al., 2015). It is important to evaluate the match play demands in football, for each position within different playing formations in order to better guide conditioning coaches and sport specific coaches to individual demands involved during football match play.

The use of Global Positioning Systems (GPS) has become increasingly popular, quantifying movements such as distance covered, accelerations, decelerations, changes of direction and various speed distances (Vickery et al., 2014; Dellaserra et al., 2014). Recently, FIFA amended their rules to allow for the use in competitive match play of electronic performance tracking systems such as direct worn GPS devices (FIFA, 2015). Since the start of the 2015-2016 Football League season in England, players have now been allowed to wear such devices (FA, 2015). These recent developments now allow for player movement and energy costs to be quantified (Akenhead et al., 2013; Neville et al., 2009).

Thus allowing for a better understanding of the physiological characteristics required to perform at elite level football. Compared to methods of tracking players such as time motion, video and hand notation systems, GPS units that are worn directly by individual players has been reported as having greater reliability and validity (Austin and Kelly, 2014; Randers et al., 2010). Specifically, when used for various measures such as accelerations, decelerations, high speed running and total distance (Stevens et al., 2015). Furthermore, if used in an integrated approach where training and match play demands are measured using differing methods these differences are far greater magnified (Vickery et al., 2014).

Although GPS tracking shows great potential for developing a far greater understanding of football science (Buchheit et al., 2014); no study to date has provided an overview of the different demands for each playing position within different playing formations. The present study sought to address this issue by examining match movements of individual positions and in various formations within 11 versus 11 football match play in England.

## Methods

Experimental approach to the problem

This study was designed to evaluate the match play demands across various formations of 11 vs 11 in professional football using portable GPS tracking, and to examine the match-play demands for the various playing position employed in different playing formations. Elite level football players from under 21s and under 18s squads were monitored during the course of competitive matches of 90 minute duration during the 2014 season (August 2014 - May 2015). Formations selected were from the 5 most popular employed in 11 versus 11 competitive match play, these were; 4-4-2, 4-3-3, 3-5-2, 3-4-3 and 4-2-3-1 (Table 1). All matches were played outdoor on natural grass pitches, dimensions of playing area length 100 metres and width 66 ± 2 metres.  Games were played during the afternoon or early evening between 13:00h – 20:30h on dates set in the fixture schedule and in accordance with the football league rules and regulations (Football League, 2014). All players abstained from any strenuous activity 24 hours before and no player participated less than 72 hours between matches. Players maintained their normal routines pre and post- match as professional football players.

## Subjects

Full time professional football players with at least 2 years' playing experience of elite level football at a professional football club (n=46, with a mean age 20 ± 3 years, height of 179 ± 5 cm, body mass of 79.5 ± 6.3 kg and estimated body fat percentage of 6.9 ± 1.5%) respectively participated in this study. Informed consent was provided by each player. Academic ethics approval was obtained even though the data was obtained from activities that players routinely undertook as part of the monitoring process during the course of the football season. This was to conform with parental consent which was also given for any player under the age of 18 years. Participants completed a health screen questionnaire prior to the study, in addition each participant's capabilities to participate in physical activity was assessed by a Doctor and qualified Physiotherapist.

## Experimental procedure

Height (m), mass (kg) and body fat were measured at regular intervals throughout the course of the season. Height and mass was determined with participants wearing minimal clothing and no footwear using a Seca (216 model) Height measure and Seca (700 model) weighing scales (Seca Ltd, Hamburg Germany). The relevant risk assessments and safety procedures were completed and strictly adhered to in accordance with the sport governing body The Football League and academic institution. Data for analysis was included from a minimum of 3 matches for each of the formations, where the formation remained for the full length of match time (90 minutes) and players who met the following criteria; a). Played a full match (90 minutes) b). Previous experience of playing in the position playing in and in the formation c). Played in the same position throughout the match. Data was filtered to exclude any activity prior to kick-off, during half time and immediately after the match, including warm up prior to start, half time re-warm up and post-match cool down. Therefore, only data from Match play was analysed.

Individual GPS units (Stat sports Newry, Northern Ireland), dimensions 86mm x 33mm x 14mm, mass 50g was worn underneath each participants playing jersey in a purpose designed tight fitting vest ensuring stability of device in situ between the shoulder blades whilst enabling unrestricted movement of upper limbs and torso. Each individual device was checked that switched on prior to kick off and remained on for the duration of the match. All participants were experienced in the wearing of the vests and units as they wear for all football training as well as Match play, none complained of any issues nor did it impede in any way their normal range of movement or performance from the result of wearing of vests and fitted units.

GPS units used captured data at 10Hz as this being identified as a far superior method than 15Hz (Johnston et al., 2014) and has been shown to achieve more valid data and has a greater reliability than other methods previously reported such as 1Hz-5Hz devices (Portas et al., 2010). The system employed for the study also had 100Hz gyroscope 100Hz tri-Axial accelerometre and 10Hz magnetometre fitted within the unit which has been shown to be more accurate than other systems that have 1-5Hz and 15Hz data capture ability (Johnston et al., 2014; Rawstorn et al., 2014). Specifically changes in running speed such as High speed running, accelerations and decelerations that occur in football (Colby et al., 2014). It has also been reported that this brand of GPS unit has a reduced error of measurement in comparison to other brands available (Marathon performance, 2014).

Data collected for analysis from each GPS unit included: Total distance (TD) covered measured in metres, High metabolic Load distance (HMLD) - includes all High speed running and all accelerations and decelerations above $2m/s^2$ measured in metres, High speed running (HSR) - all running equal to and above 19.8 km/h measured in metres, accelerations (Acc) decelerations (Dec) - total number of accelerations and decelerations performed ≥3 $m.s^{-2}$. The thresholds employed for this study were determined following a review of research in these areas that concluded that these were of the most value during match play (Akenhead et al., 2013; Barnes et al., 2014). Data was collected over the course of the 2014 season u21s (19 matches) and u18s (23 matches) met the study criteria. Participants were categorised into common positions of wide defenders (WD, n=10), central defenders (CD, n=9), Wide midfield (WM, n=9), central midfield (CM, n=10) and Forwards (FW, n=8). These were then further broken down to each individual position. Data provided from the GPS units was taken from each 90 minutes of match play including any injury time added. This was further broken down to each half. TD, HSR, HMLD, Acc and Dec from GPS units were recorded for each individual player.

Statistical Analysis

Data was presented as mean ± SD and 95% confidence intervals. Multivariate analysis of variance (MANOVA) was conducted to examine any differences in performance variables as a consequence of playing position and playing formation, wherein the dependent variables were GPS derived performance variables: Total distance (m), high speed running (m), high metabolic load distance (m), number of high speed accelerations and number of high speed decelerations. Fixed factors were playing position (wide defender; central defender; wide midfield; centre midfield; forward) and playing formation (4-4-2; 4-3-3; 3-5-2; 3-4-3; 4-2-3-1). Where any significant differences were found Bonferroni post-hoc multiple comparisons were used to determine where the difference lay. Partial $\eta^2$ was used as a measure of effect size and statistical significance was set at p = 0.05 a priori. The Statistical Package for Social Science (SPSS, version 22) was used for all analysis

## Results

There was a significant formation X position interaction, ($F$(16,184)=2.5, $p$=0.002, *Wilks' Lambda* = 0.565, *partial* $\eta^2$ = 0.18 [trivial]) and significant multivariate effects for playing formation, ($F$(24,625)=2.52, $p$=0.001, *Wilks' Lambda* = 0.724, *partial* $\eta^2$ = 0.78 [moderate]) and playing position, ($F$(24,625)=5.77, $p$=0.001, *Wilks' Lambda* = 0.497, *partial* $\eta^2$ = 0.16 [trivial]). Analysis of each individual dependent variable (with Bonferroni correction) was conducted.

Playing formation

There were significant differences in total distance (F(4,184)=2.376, p=0.05, partial $\eta^2$ = 0.05 [trivial]), HSR (F(4,184)=4.644, p=0.001, partial $\eta^2$ = 0.09 [trivial]) and HMLD (F(4,184)=5.274, p=0.001, partial $\eta^2$ = 0.10 [trivial]). Post hoc analysis indicated that TD was significantly lower in 4-4-2 (p = 0.05; $d$=0.47) and 4-2-3-1 (p = 0.003; $d$=0.34) formations compared to 3-5-2. For HSR, values were lower in 4-4-2 (p = 0.001; $d$=0.46), 3-4-3 (p = 0.045; $d$=0.22) and 4-2-3-1 (p = .001; $d$=0.25) formations compared to 3-5-2. In regard to data for HMLD values were significantly lower for 4-4-2 (p = 0.0001; $d$=0.84), 4-3-3 (p = 0.044; $d$=0.55) and 4-2-3-1 (p = 0.007; $d$=0.31) compared to 3-5-2. Values for 4-4-2 were also significantly lower than for 3-4-3 (p = 0.03; $d$=0.57) and 4-2-3-1 (p = 0.051; $d$=0.55) formations. There was also significant position X formation interactions for number of Acc ($F$(16,184)=1.781, $p$=0.036, *partial* $\eta^2$ = 0.13 [trivial] See Figure 1A), and number of Dec ($F$(16,184)=2.205, $p$=0.006, *partial* $\eta^2$ = 0.16 [trivial], See Figure 1B). Post-hoc analysis revealed that there were a significantly greater number of Acc for central midfielders in 4-2-3-1 formation compared to 4-4-2 (p = 0.012; $d$=1.52), 3-5-2 (p = 0.004; $d$=1.36) and 3-4-3 (p = 0.021; $d$=1.72) formations. There were no other significant differences in number of Acc across playing positions and formations. This pattern was somewhat replicated for number of Dec with CM having a significantly higher number of Dec in 4-2-3-1 formation compared to 4-4-2 (p = 0.001; *d*=1.90), 4-3-3 (p = 0.026; *d*=1.40) and 3-5-2 (p = 0.006; *d*=1.37) formations see Table 2.

<u>Playing position</u>

There were significant differences for TD ($F(4,184)=3.776$, $p=0.006$, *partial* $\eta^2 = 0.76$ [moderate]), HSR ($F(4,184)=20.327$, $p=0.001$, *partial* $\eta^2 = 0.31$ [small]) and HMLD ($F(4,184)=8.939$, $p=0.001$, *partial* $\eta^2 = 0.163$). Bonferroni post-hoc analysis indicated that CD had lower TD values compared to WD (p = 0.038; *d*=0.91), WM (p = 0.002; *d*=0.74), CM (p = 0.001; *d*=0.59) and FW (p = 0.042; *d*=0.79). In regard to HSR, CD had lower values compared to WD (p = 0.001; *d*=2.07), WM (p = 0.001; *d*=0.49) and FW (p = 0.001; *d*=1.48) (CM had lower values compared to WD (p = 0.001; *d*=1.34), WM (p = 0.001; *d*=0.19) and FW (p = 0.001; *d*=1.00). For HMLD, CD had significantly lower values compared to WD (p = 0.001; *d*=1.35), WM (p = 0.001; *d*=1.10), FW (p = 0.001; *d*=1.21)) and CM ((p = 0.002; *d*=0.66). CM also had significantly lower values compared to WM (p = 0.037; *d*=0.23) but higher values compared to FW (p = 0.05; *d*=0.43) see Table 3.

## Discussion

The aims of this study were to examine match-play demands in 11 versus 11 professional football and determine the physical characteristics for various playing positions employed across 5 common formations. To the authors knowledge this is the first study to present such a comprehensive data set from competitive professional football. This study revealed that all the metrics varied across all formations (Table 2). It was also found that these variations were far greater when analysing positional group data. There are studies that have examined TD, HSR, accelerations and decelerations (Akenhead et al., 2013; Mara et al., 2015) which are similar to findings of this study. Furthermore, Malone and colleagues (Malone et al., 2015), reported differences between positional groups for TD and HSR. An observation that these studies had in common was that they highlighted the lack of GPS competitive match play data. In contrast this current study has clearly identified and categorised further by including not only differences across formations but positional differences as well during competitive match play.

This current study found that 3-5-2 formation elicited higher TD (10528 ± 565m), HSR (642 ± 215m), and HMLD 2025 ± 304m) than all other formations and above average Acc and Dec (34 ± 7 and 57 ± 10), with 4-2-3-1 eliciting the highest Acc and Dec (38 ± 8 and 61 ± 12) see (Table 2). Results suggest that 3-5-2 formation overall is the most physically demanding of all formations detailed in this study, irrespective of playing position. However, that said there are marked differences in the positional demands across formations.

Analysis of positional data regardless of formation showed that WM covered the furthest TD, HMLD and greatest number of Dec, with FW covering the furthest HSR and the greatest number of Acc. When compared to the shortest distance covered and fewest number there were found to be 11%, 11%, 17%, 14%, 15% differences respectively (Table 3).

Analysis of positional data across formations showed that CM in 4-3-3 covered greater distance (10643 ± 1093 m) >11% than in 4-4-2. FW in 3-5-2 covered greater HSR (894 ± 188 m) >45% than in 4-2-3-1. CM in 4-3-3 covered greater HMLD (1686 ± 628m) >14% compared with 4-4-2. FW in 4-3-3 performed a greater number of accelerations (51 ± 13) >49% compared with 4-2-3-1. WD in 3-5-2 performed a greater number of decelerations (71 ± 4) >20% compared with 4-4-2. FW performed 20% more Acc than when playing in 4-2-3-1 and WM performed 16% more Dec also in 3-5-2 than when playing in 3-4-3 formation (Table 4). With such large differences being identified in this study it could be argued that the findings presented in this study explains why individuals within a team fatigue and also recover at different rates. The large ranges of accelerations and decelerations are not necessarily surprising given the high number of movements performed during match play. Supported further by Akenhead and colleagues who reported similar results to our study (Akenhead et al., 2013) however this study was limited as they only looked at one formation (4-4-2).

Football like other field based team sports is constantly moving, with participants often moving at low speeds such as walking and jogging then having to move quickly into high speed running then decreasing speed quickly to stop, or as in most football action events relating to ball and opponent movement, a change of direction (Bradley et al., 2013). The athletic characteristics for acceleration and deceleration are well documented within sport (Johnston et al., 2014) and specifically in football (Aughey, 2011), highlighting the importance of high speed acceleration and deceleration in performance. The ability to perform repeated bouts of HSR has been previously identified as a key characteristic required when performing at an elite level in football (Drust, Atkinson and Reilly, 2007). Furthermore, it has been reported recently to have increased in match play by as much as 30% (Barnes et al., 2014). The current study found that FW covered 25% more HSR in 3-5-2 than when playing in a 4-2-3-1 formation. It is clear from these results that there is a significant difference in distance covered at high speeds (≥19.8 km/h) not only across formations (Table 2) but also across positional groups (Table 3). HSR is an important component of the physical demands involved in football and has been reported as a key contributor to causes in fatigue (Gabbett and Ullah, 2012). Without adequate recovery from fatigue there is an increased risk of injury (Folgado et al., 2015). Certainly there is further evidence to support this (Arruda et al., 2015) suggested that non-contact injury rates increased with congested match schedule. It has also been found that fatigue effects the ability to perform repeated bouts of Acc and Dec during the latter stages of match play (Akenhead et al., 2013).

The most frequent multidirectional changes that occur during match play require players to Acc and Dec quickly, added to this the distance between the two events are covered at high speed (Bradley et al., 2013). This sequence of movements has been also termed in the past as Repeated Sprint Ability, Change of Direction, Multidirectional Agility and purposeful movement (Bangsbo, 1994; Barnes et al., 2014). These type of movements that are frequent in the HMLD have been shown to be far more physically demanding than HSR alone (Zamparo et al., 2014), with a far greater risk of injury (Chamari et al., 2004). This is mainly due to the loading and fatiguing effects that occur (Bloomfield, Polman and O'Donoghue, 2007). In the current study it was found that in 3-5-2 formation, FW recorded 16% greater HMLD than in 4-2-3-1 formation. At an elite level in sport the smallest of margins can and do make a difference, with differences as highlighted in this study could explain why many non-contact injuries occur. There is supportive evidence that has shown when fatigued there is an increased risk of injury and more specifically from repeated high intensity movements that replicate HMLD (Kellmann, 2010; Lakomy and Haydon, 2004,).

HMLD is a measure more specific to football and specificity in training has grown in popularity within team games (Little and Williams, 2005; Brughelli et al., 2008). In relation to specificity there is an increasing focus towards the conditioning of players to be more position specific and thus relating more explicitly to the physical, technical and tactical demands of games (Gamble, 2006; Nevill et al., 2009). Football is no exception and has adopted the use of position and sport specific modes of training primarily through the employment of small sided games (Owen et al., 2014). Such small sided games are reportedly an optimal method to increase physical, tactical and technical characteristics observed in football (Little, 2009). By having a more detailed understanding of the precise requirements to perform both formational and positional in match play, can now be transferred to the training ground thus enabling small sided games to be adapted to meet both the HSR and Acc, Dec that occur in HMLD. With these already illustrating different demands for each position is arguably a valid reason to structure a position specific periodised training model that could optimise the physiological demands for each positional group. There is much support for this approach across a plethora of team based sports not just football (Rugby, Hockey, Netball, Gaelic football) to name a few (Austin and Kelly, 2014; Stevens et al., 2015; Reily et al., 2015). The present study has gone further than previously published work in this area by demonstrating what differences exist between various, commonly employed, formations. This study demonstrates that it is not simply playing positon that needs to be considered by practitioners when planning training but that playing formation also impacts on match demands. Consequently, when planning periodised training programmes, coaches need to be aware of the variations that occur as a consequence of position and formations to better account for any change in demand within or between matches, cycles and whole seasons. It could also go some way to explain why a player who performs well for one team then does not perform as well for another, even though they are playing the same position, this could be due to tactical changes to formation. Thus requiring different physical characteristics that the player is unaccustomed to and therefore appears to underperform.

## Conclusion

This study presents novel data on GPS determined patterns of match play across the 5 most common playing formations employed in 11 versus 11 match play in elite level football. With direct in game monitoring from the wearing of devices during competitive match play being a recent introduction demonstrates the need for research in this evolving area. There are a number of methodological and practical issues associated with their application, which are of academic and applied interest. Furthermore, there is a need to interpret the information GPS provides, in order to improve our understanding of how it can be best employed in football to help coaches understand position specific and match formation demands in football. It is apparent that when playing in various positions and across different formations that these do impose different physical demands. Having detailed knowledge of the differences as illustrated in this study better equips coaches when evaluating performance and future needs, which in turn enables for planning the periodisation of training and specificity of training according to the individuals needs and requirements to be able to perform at their optimal level within a sport such as football.

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**Figure(s)**

**Figure 1A.** Mean ± SD of number of accelerations across different formations and playing positions

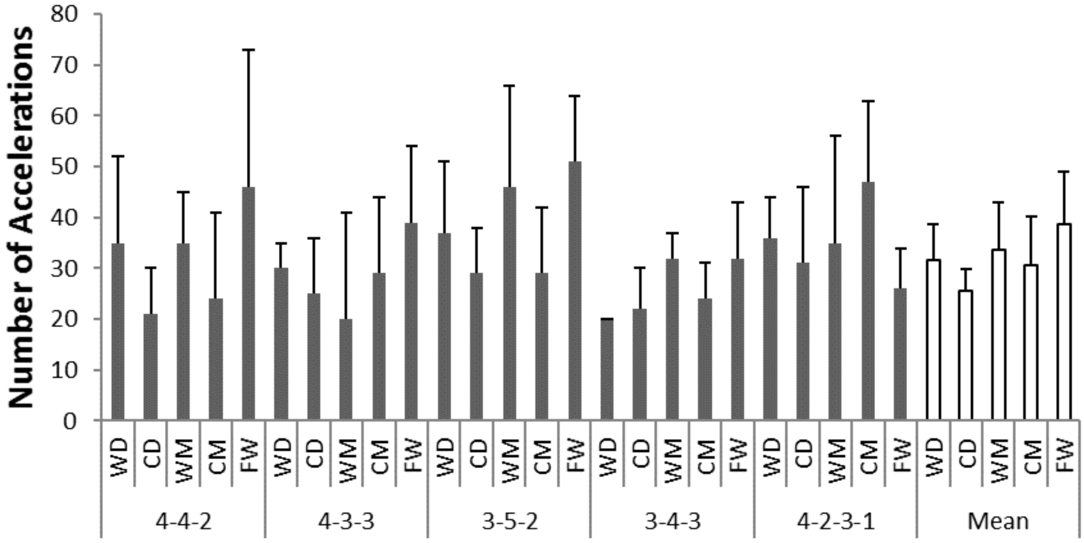
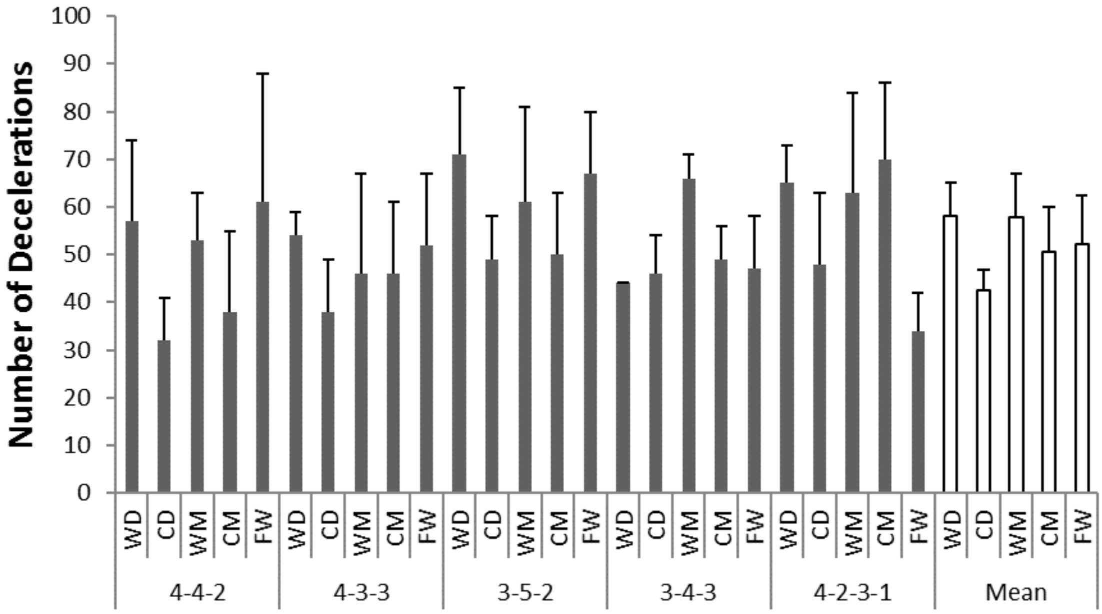



**Figure 1B.** Mean ± SD of number of decelerations across different formations and playing positions



Table(s)

**Table 1.** Monthly distribution of total number of Games and players evaluated across all formations during the season

| Formation | Month | August | September | October | November | December | January | February | March | April | May | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-4-2 | Number of games n= | n=2 | n=0 | n=1 | n=1 | n=1 | n=0 | n=1 | n=1 | n=2 | n=0 | 9 |
| | Number of players n= | n=16 | n=0 | n= 8 | n=7 | n=9 | n=0 | n=7 | n=7 | n=12 | n=0 | 66 |
| 4-3-3 | Number of games n= | n=1 | n=1 | n=1 | n=2 | n=1 | n=0 | n=0 | n=0 | n=1 | n=0 | 7 |
| | Number of players n= | n=8 | n=6 | n=6 | n=14 | n=7 | n=0 | n=0 | n=0 | n=9 | n=0 | 50 |
| 3-5-2 | Number of games n= | n=2 | n=1 | n=2 | n=1 | n=1 | n=2 | n=0 | n=0 | n=1 | n=0 | 10 |
| | Number of players n= | n=15 | n=8 | n=13 | n=9 | n=7 | n=18 | n=0 | n=0 | n=8 | n=0 | 78 |
| 3-4-3 | Number of games n= | n=0 | n=2 | n=0 | n=0 | n=0 | n=3 | n=1 | n=0 | n=0 | n=0 | 6 |
| | Number of players n= | n=0 | n=14 | n=0 | n=0 | n=0 | n=19 | n=6 | n=0 | n=0 | n=0 | 39 |
| 4-2-3-1 | Number of games n= | n=0 | n=0 | n=0 | n=0 | n=2 | n=0 | n=3 | n=3 | n=3 | n=0 | 11 |
| | Number of players n= | n=0 | n=0 | n=0 | n=0 | n=13 | n=0 | n=18 | n=21 | n=20 | n=0 | 89 |

**Table 2.** Mean ± SD of total distance (TD), high speed running (HSR), high metabolic load distance (HMLD), Highs speed Accelerations (Acc) and High speed Deceleration (Dec) across different formations.

| | **TD (m)** | **HSR (m)** | **HMLD (m)** | **Acc (n)** | **Dec (n)** |
|---|---|---|---|---|---|
| **Formation & Number of Games** | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** |
| 4-4-2 (n=9) | 10131 ± 583 | 497 ± 175 | 1568 ± 257 | 33 ± 10 | 49 ± 14 |
| 4-3-3 (n=7) | 10284 ± 879 | 514 ± 204 | 1828 ± 518 | 32 ± 8 | 50 ± 12 |
| 3-5-2 (n=10) | 10528 ± 565 | 642 ± 215 | 2025 ± 304 | 34 ± 7 | 57 ± 10 |
| 3-4-3 (n=6) | 10168 ± 449 | 551 ± 171 | 1855 ± 301 | 28 ± 7 | 51 ± 10 |
| 4-2-3-1 (n=11) | 10044 ± 538 | 538 ± 174 | 1849 ± 301 | 38 ± 8 | 61 ± 12 |

**Table 3.** Mean ± SD of total distance (TD), high speed running (HSR), high metabolic load distance (HMLD), Highs speed Accelerations (Acc) and High speed Deceleration (Dec) across position.

| | TD (m) | HSR (m) | HMLD (m) | Acc (n) | Dec (n) |
|---|---|---|---|---|---|
| **Position & Number of players** | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** | **Mean ± SD** |
| WD (n=10) | 10152 ± 714 | 660 ± 117 | 1850 ± 200 | 34 ± 6 | 56 ± 14 |
| CD (n=9) | 9669 ± 454 | 396 ± 76 | 1527 ± 192 | 27 ± 7 | 45 ± 8 |
| WM (n=9) | 10523 ± 456 | 636 ± 172 | 1912 ± 366 | 35 ± 5 | 62 ± 9 |
| CM (n=10) | 10395 ± 619 | 429 ± 133 | 1781 ± 345 | 33 ± 10 | 53 ± 12 |
| FW (n=8) | 10502 ± 778 | 690 ± 186 | 2476 ± 1339 | 38 ± 8 | 55 ± 12 |

Table(s)

**Table 4.** Mean ± SD and 95% Confidence Intervals of total distance (TD), high speed running (HSR), high metabolic load distance (HMLD), across different formations and playing positions.

| | | TD (m) | | HSR (m) | | HMLD (m) | |
|---|---|---|---|---|---|---|---|
| **Formation** | **Position** | **Mean±SD** | **95%CI** | **Mean±SD** | **95%CI** | **Mean±SD** | **95%CI** |
| 4-4-2 | WD | 10075±1126 | 9241-10909 | 675±172 | 544-805 | 1788±399 | 1516-2060 |
| | CD | 9711±1236 | 8724-10698 | 360±91 | 205-514 | 1407±322 | 1085-1729 |
| | WM | 10462±554 | 9628-11296 | 599±157 | 468-729 | 1843±262 | 1571-2116 |
| | CM | 9886±1516 | 9052-10720 | 308±162 | 178-439 | 1377±605 | 1105-1649 |
| | FW | 10365±1051 | 9378-11351 | 539±256 | 384-693 | 1816±439 | 1494-2138 |
| 4-3-3 | WD | 10229±972 | 9242-11215 | 683±252 | 529-838 | 1958±426 | 1636-2280 |
| | CD | 9167±471 | 8266-10068 | 348±58 | 207-489 | 1432±144 | 1138-1726 |
| | WM | 10985±730 | 9425-12545 | 711±433 | 466-955 | 1930±621 | 1421-2439 |
| | CM | 10643±1093 | 9809-11477 | 357±183 | 226-487 | 1686±628 | 1414-1959 |
| | FW | 10648±452 | 9374-11922 | 802±129 | 602-1001 | 2177±107 | 1761-2592 |
| 3-5-2 | WD | 10844±667 | 10233-11456 | 818±169 | 722-914 | 2256±280 | 2056-2456 |
| | CD | 10034±676 | 9499-10569 | 449±138 | 365-533 | 1741±343 | 1567-1916 |
| | WM | 10772±1153 | 9498-12046 | 664±281 | 464-863 | 1978±422 | 1562-2394 |
| | CM | 10659±974 | 10199-11119 | 502±180 | 430-574 | 1913±352 | 1762-2063 |
| | FW | 10832±934 | 10052-11612 | 894±188 | 772-1017 | 2337±374 | 2082-2591 |
| 3-4-3 | WD | 9936±475 | 7729-12142 | 573±95 | 228-918 | 1815±174 | 1095-2535 |
| | CD | 9575±938 | 8840-10311 | 406±138 | 290-521 | 1511±324 | 1271-1751 |
| | WM | 10414±591 | 9513-11314 | 718±97 | 577-859 | 2153±269 | 1859-2447 |
| | CM | 10630±444 | 9729-11531 | 434±106 | 293-575 | 1935±232 | 1641-2229 |
| | FW | 10660±1022 | 9962-11357 | 675±222 | 566-784 | 2045±425 | 1818-2273 |
| 4-2-3-1 | WD | 10468±826 | 9831-11105 | 729±162 | 629-829 | 2049±344 | 1841-2257 |
| | CD | 9677±827 | 9125-10228 | 430±169 | 343-516 | 1582±341 | 1402-1762 |
| | WM | 10268±538 | 9603-10934 | 685±196 | 581-789 | 2024±282 | 1807-2241 |
| | CM | 10329±2488 | 9794-10864 | 487±182 | 403-570 | 1990±350 | 1815-2164 |
| | FW | 8644±984 | 7370-9917 | 353±143 | 154-553 | 1452±380 | 1036-1867 |