

# STRATEGIES TO IMPROVE RUNNING ECONOMY

Results from high intensity training studies are unclear, but the best results to improve RE appear to occur when training at near maximal or supramaximal intensities on flat or uphill terrain

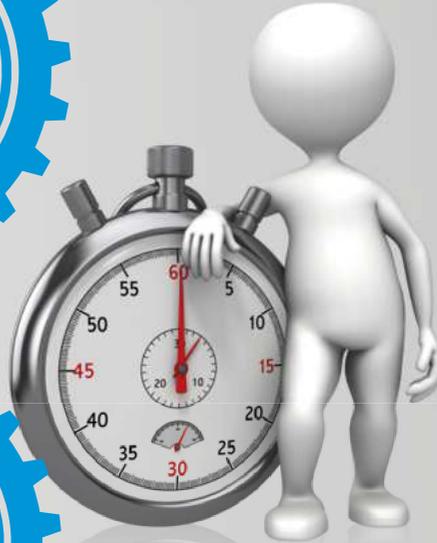


The most common strategies used to improve running economy are resistance & plyometric training and explosive resistance training

**NUTRITIONAL STRATEGIES**  
Ingestion of dietary nitrate, especially in the form of beetroot juice, also appears to hold promise as a natural means to improve RE

**ALTITUDE**  
Acclimatisation results in better oxygen delivery & utilisation, mechanisms that potentially could improve RE

**STRETCHING**  
It can improve RE; however, it appears that there is an optimal degree of flexibility and stiffness required to maximise this gain



Reference: Barnes & Kilding  
Sports Medicine, August 2014

Designed by @YLMsPortScience

## REPEATED SPRINT ABILITY (RSA)

Within professional football, *RSA* is associated with the player's ability to reproduce maximal effort sprints over short distances, typically less than 10 seconds in duration and followed by set recovery periods in between repetitions.

Elite professional football players have been observed performing between 8 and 18 sprints during a game (Di Salvo et al., 2009; Bradley et al., 2009; Dellal et al., 2010). The sprints a football player performs during competitive match-play are generally between 10 and 25 metres in length, or 3-5 seconds in duration (Barros et al., 2007). The recent importance placed on reducing both the number, and durations of recovery bouts required within the competitive environment, coupled with the increased emphasis on training specificity, has opened up more discussions and research surrounding the area of *repeated sprint training (RST)* for cyclical repeated sprint sports, such as football (Bompa, 1999; Dupont et al., 2005).

Performance in most multiple-sprint team sports is dominated by technical and tactical qualities of the players involved. Therefore, according to some research, the importance of *RSA* as a fundamental physical variable of team-sport performance has been questioned (Buchheit et al., 2010). However, fatigue development in team sports such as football has been linked with the ability to reproduce sprints. This increase in fatigue is associated with significant reductions in sprint and high-speed running actions observed towards the end of elite football matches (Mohr et al., 2003). The randomised flow of a competitive game leads to numerous periods of intense activities, inclusive of sprinting, which may determine the final outcome of a game through winning or maintaining possession of the ball, or conceding/scoring goals (Trappattoni, 1999). Earlier research has suggested that a ~0.8% reduction in sprint speed can significantly increase a player's probability of losing possession to the opposition when two players on opposite sides sprint to compete for the ball (Paton et al., 2001).

### Power Actions in Goal Scoring Situations

Recent literature has attempted to progress this physical-success notion even further through analysing the influence of speed and power abilities in goal situations in professional football. Research by Faude et al., (2012) examined videos of 360 goals in the German 1st division and highlighted the situations immediately preceding the goals. The actions observed pre-goal scoring were categorised as:

- No Powerful Action
- Rotation (Around the Body's Centre-Line)
- Straight Sprint
- Change of Direction Sprint
- Jump
- Any Combination of the Above

The results revealed that 298 (or 83%) of the goals were preceded by a minimum of one powerful action performed by the scoring or assisting player. The most common actions for the scoring player were:

- A straight sprint (161 or 45% of all analysed goals)
- Jumping (57 or 16%)
- Rotations (22 or 6%)
- Change of Direction Sprints (22 or 6%)

Faude et al., (2012) also revealed that most sprints from the 360 goals analysed were conducted without pressure from an opponent (109) and without the ball (121). Additionally, when discussing the role of the assisting player, the most frequent action was:

- A straight sprint (137 or 38%)
- Rotations (28 or 8%)
- Jumping (22 or 6%)
- Change of Direction Sprints (18 or 5%)



It should be noted that straight sprints leading to goals scored for the assisting players were mostly conducted with the ball (93 out of 360 goals). To conclude the work of Faude et al., (2012), straight sprinting is the most frequent action performed by either the assisting or scoring players within competitive match-play situations that lead to goals. Subsequently, it should

be noted that power, speed and most importantly the ability to reproduce sprints to a high level are of paramount importance within decisive situations in professional football and therefore, should be included in both fitness testing and training situations.



### KEY POINT:

*Power, speed and most importantly the ability to reproduce sprints to a high level are of paramount importance within decisive situations in professional football and therefore, should be included in both fitness testing and training situations.*



# CHAPTER 3

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## SPEED TRAINING DRILLS

## Sprint, Cross and Finish in a Speed Endurance Circuit



### Description

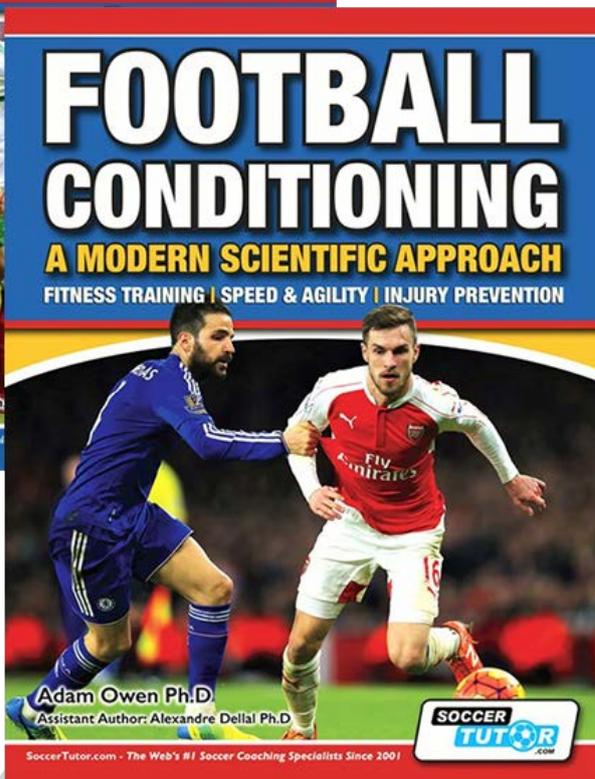
In this practice we have 2 groups (red and blue) who alternate working on the coach's whistle to ensure adequate recovery for the players. This is to maximise the acceleration and sprint work in the session. The players perform 2/3 sets of 4-6 repetitions each.

There are a minimum of 2 players on each station as shown (A, B, C, and D). There is also 1 extra player (feeder) who starts the practice by passing to Player A who moves forward (timing his run) to cross the ball first time. Players B, C and D sprint at maximum speed to try and score past the goalkeeper. At the same time, the 3 players outside the area perform a 30 yard sprint before walking (recovery) to positions B, C and D respectively.

Players B, C and D then walk (recovery) outside the area to perform a 30 yard sprint. Player A moves to the feeder position and the feeder moves to the back of group A.

### Coaching Points

1. Players must work at maximum speed throughout all the different movements.
2. Players need to demonstrate good timing, a high intensity/speed of run and technical quality when passing to ensure maximum acceleration.
3. High quality is needed for the technical aspects so the practice maintains rhythm.



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