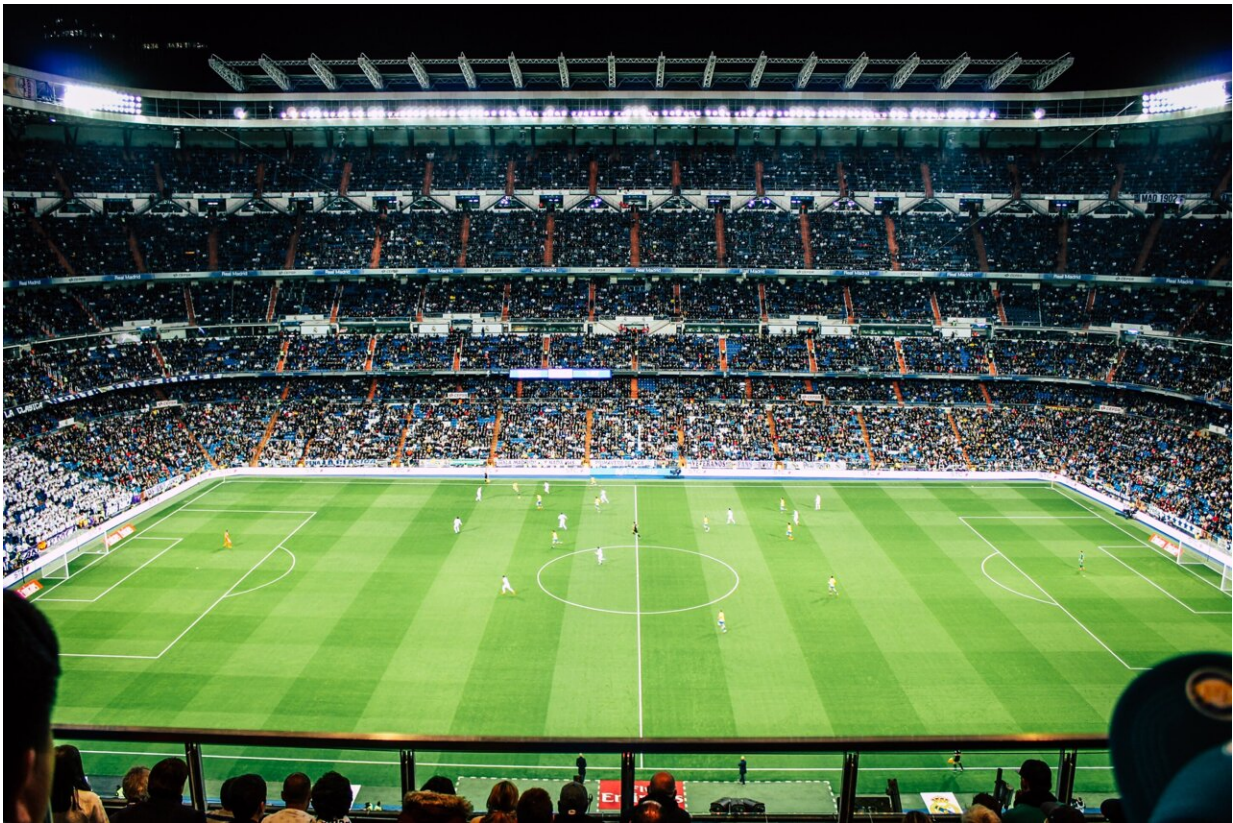


# Aerobic fitness of elite soccer players linked to player positions

January 20 2022

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Researchers have linked the fitness of elite soccer players to the positions they play.

The ability to make this assessment can help coaches regulate individual training loads based on player position, according to a recent study.

The study found that all positions on a [soccer](#) pitch except center backs showed a strong association between aerobic power training and high-intensity performance.

"It is perhaps not surprising because center backs cover less distance and perform fewer power events than other field positions," said Matteo Masucci, a Ph.D. candidate in Kinesiology and Health Sciences at the University of Waterloo. "Center backs face the pitch and control the situation. They have a slower pace and play more of a mental or tactical game. Midfielders analyze everything in front and behind them and must react in both these directions. Strikers need to express maximal effort to get a shot off at the right time."

Researchers worked with data from 62 Italian Serie A soccer players over a full season between 2014-15 and 2018-19 and tested whether targeted treadmill training and lactate blood samples from the players' earlobes properly assessed aerobic fitness—the overall amount of energy required to perform a high-power event like acceleration or deceleration.

"When paired with videos of on-field performance, our analysis showed that the link between aerobic fitness and repeated high-intensity sequences in a game varied with the position a soccer competitor played," said Masucci, who is also a soccer coach.

It was found that during a 90-minute game, an elite soccer player can make up to 1,400 activity changes and up to 200 short multidirectional high-intensity efforts, necessitating physical conditioning not only in terms of speed but in movement pattern changes as well.

Previous studies have investigated the association between aerobic

fitness and soccer, but only in the speed category. Masucci said because of the acceleration and deceleration that elite soccer players must expend, as well as the time it takes to recover from high-intensity sequences, it is also important to study high-power events that are not related to speed.

"These findings mean that coaches can use lactate [blood samples](#) and incremental treadmill assessments to provide valuable information about soccer players," Masucci said. "Players who have a high metabolic power distance cut-off equal to or higher than 1,450 m for center backs, 1,990 m for full-backs, 2,170 m for midfielders and 1,670 m for forwards could be considered as having superior aerobic fitness. Therefore, when planning training and game strategy, coaches should consider these individual differences in physiological and physical performance."

The study, Relationship between aerobic [fitness](#) and metabolic power metrics in elite male [soccer players](#), was led by Vincenzo Manzi (Università Telematica Pegaso), and co-authored by Masucci, Giuseppe Annino, Cristian Savoia, Giuseppe Caminiti, Elvira Padua, Rosario D'Onofrio and Ferdinando Iellamo. It was published in the journal *Biology of Sport*.

**More information:** Vincenzo Manzi et al, Relationship between aerobic fitness and metabolic power metrics in elite male soccer players, *Biology of Sport* (2021). [DOI: 10.5114/biolsport.2022.106389](https://doi.org/10.5114/biolsport.2022.106389)

Provided by University of Waterloo

Citation: Aerobic fitness of elite soccer players linked to player positions (2022, January 20) retrieved 27 April 2024 from <https://medicalxpress.com/news/2022-01-aerobic-elite-soccer-players-linked.html>

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