



Anaerobic metabolism in soccer: Analysis of external load of Primavera Championship with Gps Devices

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BACKGROUND

Soccer is a multifaceted sport. Performance depends on many factors: technical, biomechanical, tactical, mental and physical.

METHODS

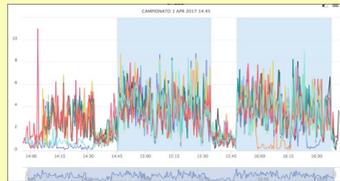
We used GPS devices (GPEXE 18 Hz) to analyze a team of 28 soccer players without goalkeepers (age 18,6 ± 0.629 years; height 1,79±0.062 m; weight 74.4±6,901 kg).

We recorded 22 matches of “Primavera” championship choosing only the players who finished the match. We analyzed some parameters: Distance, Equivalent Distance Coverage, Anaerobic Energy, Accelerations, Decelerations, Metabolic Power and Recovery times.

The statistical analysis was processed using the multi-factor ANOVA procedure.



Picture 1. Gps Device



Picture 2. Match recorded with Gps

CONCLUSIONS

Soccer players’ performance decline markedly during the second half, and this study suggest which parameter had a greater decrement for plan an appropriate training program.

Suggest, also, which value need to training more for determinate a lower performance’s decrement, and for create specific exercises according to energetics demands.

REFERENCES

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AIMS

The purpose of this study is the analysis, through the use of GPS devices, of the parameter of the external load of anaerobic metabolism in official championship matches.

This study consider: time match, players’ roles and round.

RESULTS

There’s no statistically significant difference between the first and second round, but there’s differences between the first and second halves (P-value<0.05) for Distance, Equivalent Distance Acceleration, Deceleration, Metabolic Power.

We noticed that in second halves there was more rest. The midfielders covered more distance and had higher values of metabolic power.

The attackers had higher values of accelerations and decelerations.

The defender had a lower physical demands.

Sorgente	Somma dei quadrati	G.L.	Media dei quadrati	Rapporto F	P-value
EFFETTI PRINCIPALI					
A:GIRONE	82,5027	1	82,5027	3,73	0,0542
B:PERIODO	250,514	1	250,514	11,32	0,0008
C:RUOLO	4739,37	2	2369,69	107,08	0,0000
INTERAZIONI					
AB	43,5203	1	43,5203	1,97	0,1616
AC	112,514	2	56,2569	2,54	0,0800
BC	25,2305	2	12,6153	0,57	0,5660
ABC	24,1132	2	12,0566	0,54	0,5804
RESIDUO	8475,67	383	22,1297		
TOTALE (CORRETTO)	113859,1	394			

Table 1. Analysis of Variance for Acceleration

Table 2. Multi comparison test for Acceleration for Period.

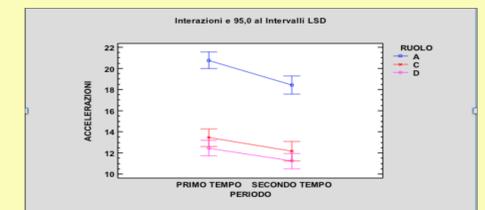
PERIODO	Conteggio	Media dei Min. Quad.	Sigma dei Min. Quad.	Gruppi omogenei
SECONDO TEMPO	186	13,9344	0,35108	X
PRIMO TEMPO	209	15,5524	0,328622	X

Contrasto	Sig.	Differenza	+/- Limiti
PRIMO TEMPO - SECONDO TEMPO	*	1,61796	0,945305

RUOLO	Conteggio	Media dei Min. Quad.	Sigma dei Min. Quad.	Gruppi omogenei
D	158	11,839	0,375049	X
C	108	12,7928	0,454231	X
A	129	19,5985	0,416321	X

Contrasto	Sig.	Differenza	+/- Limiti
A - C	*	6,80569	1,21148
A - D	*	7,75947	1,10174
C - D		0,953786	1,15819

Table 3. Multi comparison test for Acceleration for Role



Graph 1. Interactions between Accelerations and Role

Sorgente	Somma dei quadrati	G.L.	Media dei quadrati	Rapporto F	P-value
EFFETTI PRINCIPALI					
A:GIRONE	1,60884E6	1	1,60884E6	3,45	0,0640
B:PERIODO	2,31553E7	1	2,31553E7	49,64	0,0000
C:RUOLO	1,25927E7	2	6,29637E6	13,50	0,0000
INTERAZIONI					
AB	46627,0	1	46627,0	0,10	0,7520
AC	1,90379E6	2	951895,	2,04	0,1313
BC	2,31496E6	2	1,15748E6	2,48	0,0850
ABC	540983,	2	270492,	0,58	0,5604
RESIDUO	1,78644E8	383	466433,		
TOTALE (CORRETTO)	2,20113E8	394			

Table 4. Analysis of Variance for Total Distance

PERIODO	Conteggio	Media dei Min. Quad.	Sigma dei Min. Quad.	Gruppi omogenei
SECONDO TEMPO	186	4916,28	50,9697	X
PRIMO TEMPO	209	5408,18	47,7094	X

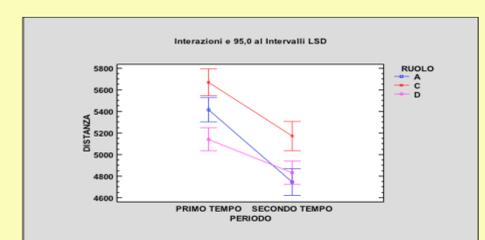
Contrasto	Sig.	Differenza	+/- Limiti
PRIMO TEMPO - SECONDO TEMPO	*	491,902	137,268

Table 5. Multi comparison test for Total Distance for Period.

RUOLO	Conteggio	Media dei Min. Quad.	Sigma dei Min. Quad.	Gruppi omogenei
D	158	4986,37	54,4497	X
A	129	5080,01	60,4416	X
C	108	5420,32	65,9453	X

Contrasto	Sig.	Differenza	+/- Limiti
A - C	*	-340,311	175,882
A - D		93,6362	159,95
C - D	*	433,947	168,146

Table 6. Multi comparison test for Total Distance for Role



Graph 2. Interactions between Distance and Role