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Consideration Regarding the Guidance of the Sportive Shape from a Weekly Cycle to Another Using Analysis Software in High Performance Football

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Abstract

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The content of the research content is trying to prove that physical training can be optimized from a weekly cycle to another, in quantitative and qualitative terms. One of the requirements is to always check the training level of the team with various stimuli and, in this context, the sportive shape from one game to another. This can be monitored using the "INSTAT" System of analysis after each competition. The statistic obtained gives us physical data that we can compare from one game to another, both within the team, but especially individually, such as the distance travelled by team/ player, the total distance broken down by intensities, the number of accelerations and sprints. These issues confirm or disprove that the guidance of the effort from a competition to another is within optimal standards. As a result of the interpretation of the data offered by the analysis system, it can be found a pattern to achieve and maintain optimum sportive shape to ensure the superiority, on the physical plane, over the opponent. The permanent individualization of the training process is crucial in a weekly cycle, because not all the athletes react the same way to the training stimuli, reaching unwanted areas of effort for that training, and thus disturbing the preparation process in the next weekly cycles of the competitive period.

Keywords: Football; physical preparation; sportive shape.

1. Introduction

Football game represents an activity with an alternative aerobic-anaerobic demand, so that, on a more or less constant aerobic basis, there are repeatedly inserted anaerobic phases of maximum intensity. Among all sports games, football has the highest aerobic demand imposed by both the game duration and the distance that the footballers have to cover (Stoica, 2003).

On the other hand, the game phases mainly consist of fully demanding actions performed at maximum speed and lasting a few seconds – most of them, between 1 and 20 seconds.

In terms of physical effort, football game falls into the category of sports disciplines with a mixed effort; the energy supplied to sustain competitive effort is provided by all three energy systems in different proportions (Stoica & Blejan, 2012).

For physical trainers, information from the technological, biological, video-IT and methodological fields is crucial to optimizing physical training during the preparation and competition process (Stoica & Blejan, 2012).

The purpose. Through the content of this research, we are trying to prove that physical preparation can be optimized from one weekly cycle to another, from both the qualitative and quantitative points of view. One of the requirements is to permanently check, with different stimuli, the group preparation level and, in this context, the sportive shape from one game to another. This can be monitored using the "INSTAT" analysis system software after each competition.

The obtained statistic provides us physical data that we can compare from one game to another, at both the group (team) and especially the individual level, such as: distance travelled by the team/ player, total distance parcelled on intensities, number of accelerations and sprints, aspects which confirm or disprove that the effort management from one competition to another is within optimal standards.

The research hypothesis. Statistical data provided by the "INSTAT" software give us information which, if analysed and applied during the weekly cycle, can influence, in one way or another, the sportive shape.

Group of subjects: components of CS Universitatea Craiova football team - 1st League.

The program was applied to the entire group of players from CS Universitatea Craiova, a 1st League team. The group was made up of 29 players. Among them, 8 played in both Game 1 and Game 2.

2. Materials and methods

The preparation program designed for the period between the two games - competitions was conducted over 7 weeks. Within the preparation process, two aspects changed:

- aerobic work power increased from two to three rounds of 5-7 minutes, with travelled distances between 30 and 100m, and the working time between 6 and 16 seconds, with breaks equal to or twice as much as the effort;
- muscle strength was not worked any more only through the content of field training sessions, but also through the work in the weight gym, on the basis of individualization and using exercises performed at different intensities during the 7 weeks.

3. Results

We conducted directly the physical preparation of the team, by individualizing the preparation process on the basis of physical reports received weekly, after each competition. During this period, 10 official games were played, two in the Romanian Cup - both won - and 8 games in the 1st League, where we collected 20 points.

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These aspects contribute to maintaining an optimal psychic-physical condition at the group level, which makes us confident that physical preparation can be optimized, standardized throughout the competition calendar.

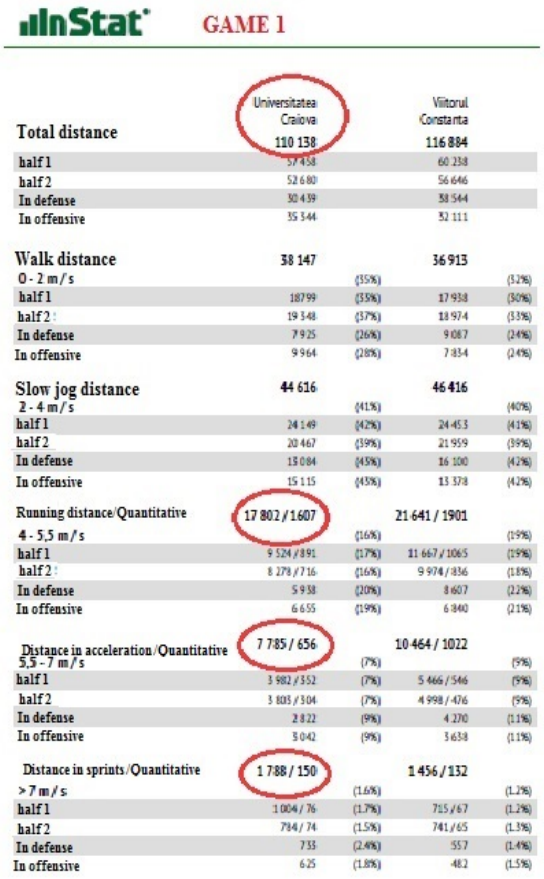
Game no. 1 took place on August 8, 2014, and the data received, as well as the team's evolution, were satisfactory. Data analysis indicated however that the players did not have enough aerobic power, the aerobic work within the weekly cycle was not sufficient and their muscle strength did not allow them to perform the number of sprints intended. We started increasing the aerobic work (MAV-maximum aerobic volume) weekly and, from 1,500 meters of aerobic power covered by the players within several repetitions, they managed to work 3,000 meters, and at the muscle level, to alternate and even combine the work performed in the weight gym with the specific fieldwork.

On September 28, 2014 (Game no. 2), the team showed an increase, both quantitatively and qualitatively, in all aspects. There was significant increase in the distance covered as a team and increase in the number and distance of sprints. From 3 players who were traveling a distance of over 10 km in the game, it was reached the number of 8 players who did that; moreover, 5 of them exceeded 11 km, which confirmed that the analysis, decisions and imposed schedule had been effective. This training program, designed for being applied between the two games, lasted 7 weeks.

Throughout the preparation process, only two things changed: aerobic work power increased from two to three rounds of 5-7 minutes, with travelled distances between 30 and 100m, and the working time between 6 and 16 seconds, with breaks equal to or twice as much as the effort; muscle strength was not worked any more only on the field, but also in the weight gym, where the team worked at different intensities.

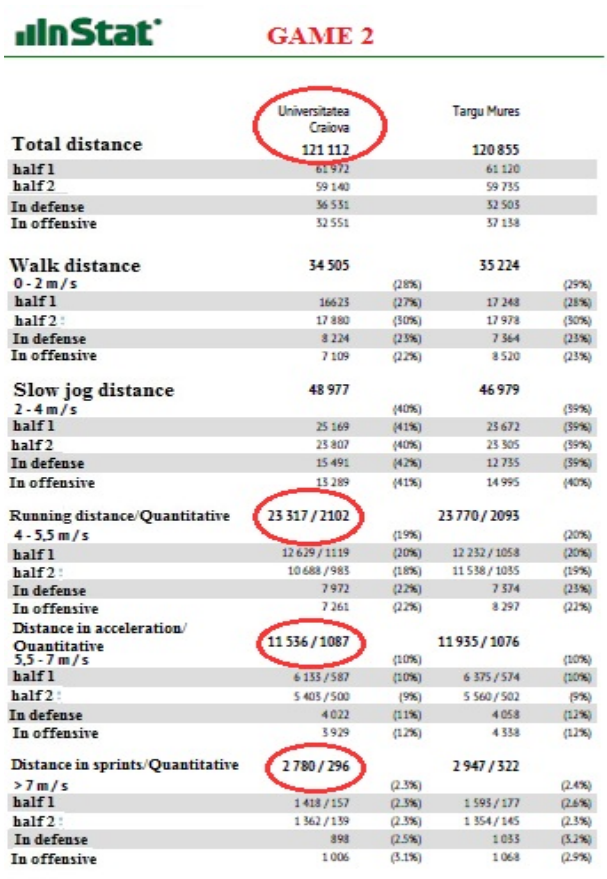
Table 1. Number of training assigned to each type of effort

	Aerobic work 120% MAV	Muscle work
Week No. 1	1700 m	Gym = 80-85 %
Week No. 2	1900 m	Field = Strength – speed
Week No. 3	2100 m	Gym = 90-95%
Week No. 4	2300 m	Field = Strength – speed
Week No. 5	2500 m	Gym = 65-70%
Week No. 6	2700 m	Field = Strength – speed
Week No. 7	3000 m	Gym = 80-85%



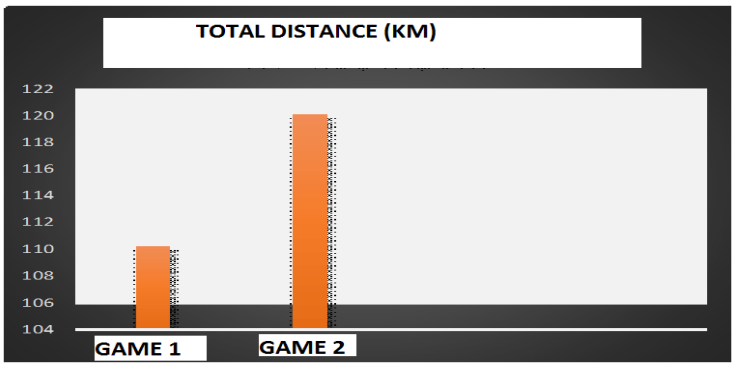
GAME 1	Universitatea Craiova		Viitorul Constanta	
Total distance	**110 138**		**116 884**	
half 1	57 458		60 238	
half 2	52 680		56 646	
In defense	50 439		58 544	
In offensive	55 344		52 111	
Walk distance	**38 147**		**36 913**	
0 - 2 m / s		(35%)		(32%)
half 1	18799	(35%)	17 938	(30%)
half 2 :	19 348	(37%)	18 974	(33%)
In defense	7 925	(26%)	9 087	(24%)
In offensive	9 964	(28%)	7 834	(24%)
Slow jog distance	**44 616**		**46 416**	
2 - 4 m / s		(41%)		(40%)
half 1	24 149	(42%)	24 453	(41%)
half 2	20 467	(39%)	21 959	(39%)
In defense	13 084	(45%)	16 100	(42%)
In offensive	15 115	(45%)	13 378	(42%)
Running distance/Quantitative	**17 802 / 1607**		**21 641 / 1901**	
4 - 5,5 m / s		(16%)		(19%)
half 1	9 524 / 891	(17%)	11 667 / 1065	(19%)
half 2 :	8 278 / 716	(16%)	9 974 / 836	(18%)
In defense	5 938	(20%)	8 607	(22%)
In offensive	6 655	(19%)	6 840	(21%)
Distance in acceleration/Quantitative	**7 785 / 656**		**10 464 / 1022**	
5,5 - 7 m / s		(7%)		(9%)
half 1	3 982 / 352	(7%)	5 466 / 546	(9%)
half 2	3 803 / 304	(7%)	4 998 / 476	(9%)
In defense	2 822	(9%)	4 270	(11%)
In offensive	3 042	(9%)	3 638	(11%)
Distance in sprints/Quantitative	**1 788 / 150**		**1 456 / 132**	
> 7 m / s		(1.6%)		(1.2%)
half 1	1 004 / 76	(1.7%)	715 / 67	(1.2%)
half 2	784 / 74	(1.5%)	741 / 65	(1.3%)
In defense	733	(2.4%)	557	(1.4%)
In offensive	625	(1.8%)	482	(1.5%)

Fig. 1. The parameters obtained by the players in Game 1

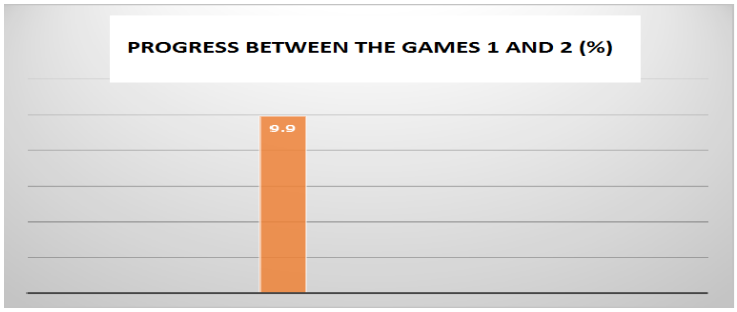


GAME 2	Universitatea Craiova		Targu Mures	
Total distance	**121 112**		**120 855**	
half 1	61 972		61 120	
half 2	59 140		59 735	
In defense	36 531		52 503	
In offensive	32 551		37 138	
Walk distance	**34 505**		**35 224**	
0 - 2 m / s		(28%)		(29%)
half 1	16623	(27%)	17 248	(28%)
half 2 :	17 880	(30%)	17 978	(30%)
In defense	8 224	(23%)	7 364	(23%)
In offensive	7 109	(22%)	8 520	(23%)
Slow jog distance	**48 977**		**46 979**	
2 - 4 m / s		(40%)		(39%)
half 1	25 169	(41%)	23 672	(39%)
half 2	23 807	(40%)	23 305	(39%)
In defense	15 491	(42%)	12 735	(39%)
In offensive	13 289	(41%)	14 995	(40%)
Running distance/Quantitative	**23 317 / 2102**		**23 770 / 2093**	
4 - 5,5 m / s		(19%)		(20%)
half 1	12 629 / 1119	(20%)	12 232 / 1058	(20%)
half 2 :	10 688 / 983	(18%)	11 538 / 1035	(19%)
In defense	7 972	(22%)	7 374	(23%)
In offensive	7 261	(22%)	8 297	(22%)
Distance in acceleration/ Quantitative	**11 536 / 1087**		**11 935 / 1076**	
5,5 - 7 m / s		(10%)		(10%)
half 1	6 133 / 587	(10%)	6 375 / 574	(10%)
half 2 :	5 403 / 500	(9%)	5 560 / 502	(9%)
In defense	4 022	(11%)	4 058	(12%)
In offensive	3 929	(12%)	4 338	(12%)
Distance in sprints/Quantitative	**2 780 / 296**		**2 947 / 322**	
> 7 m / s		(2.3%)		(2.4%)
half 1	1 418 / 157	(2.5%)	1 593 / 177	(2.6%)
half 2 :	1 362 / 139	(2.3%)	1 354 / 145	(2.3%)
In defense	898	(2.5%)	1 033	(3.2%)
In offensive	1 006	(3.1%)	1 068	(2.9%)

Fig. 2. The parameters obtained by the players in Game 2



Graph 1. Total distance travelled (km)



Graph 2. The progress between the games No. 1 and No. 2

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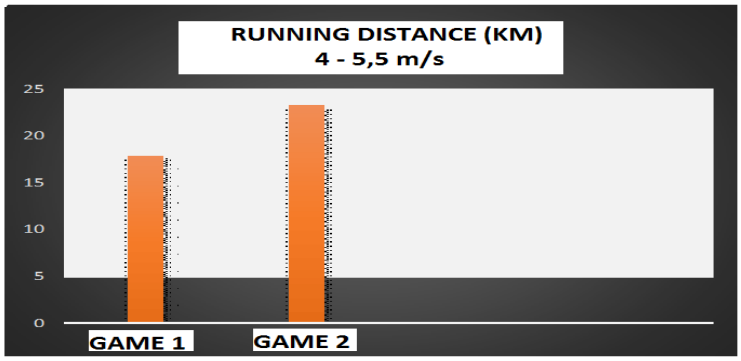
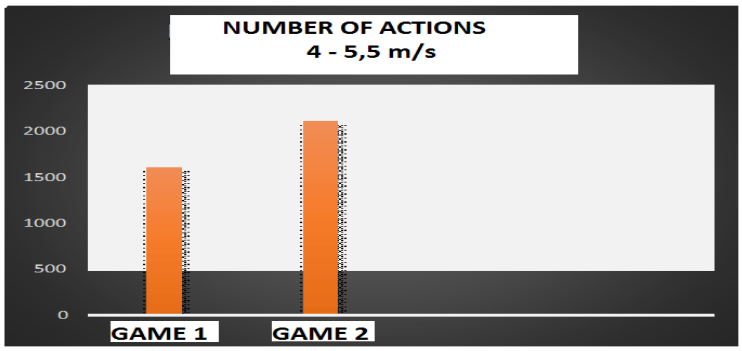
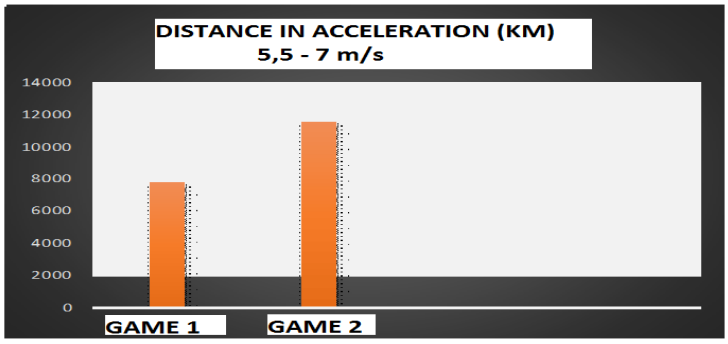


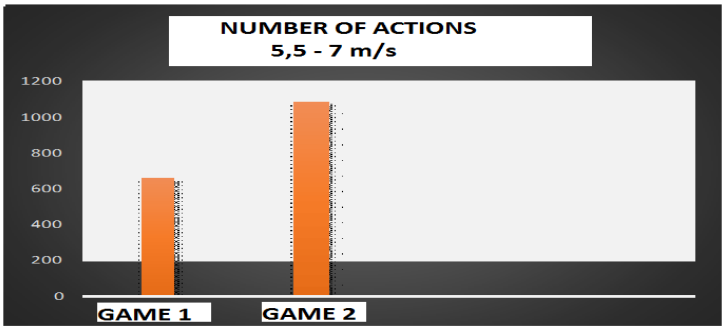
Graph 3. Running distance (km)



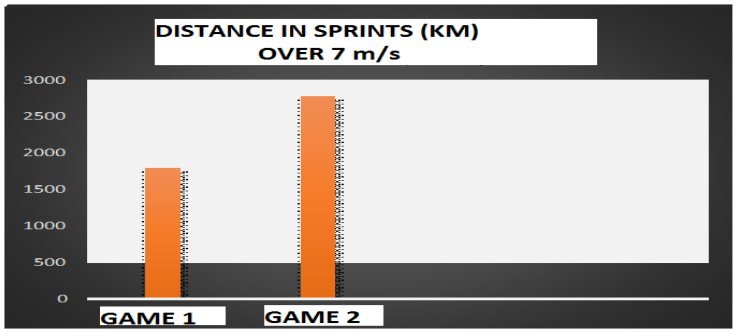
Graph 4. Number of actions



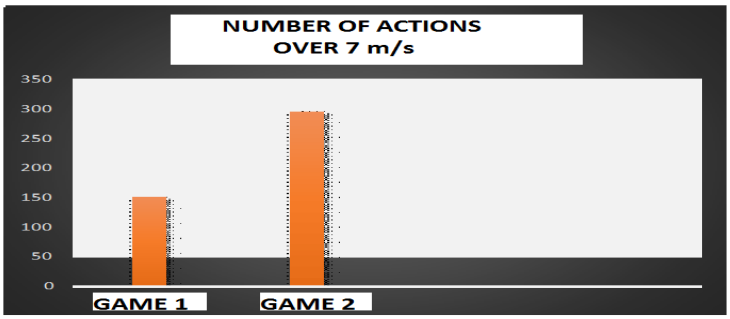
Graph 5. Distance in acceleration (km)



Graph 6. Number of actions



Graph 7. Distance in sprints (km)



Graph 8. Number of actions

InStat GAME 1

Universitatea Craiova

	Minutes in court	Total distance	Average speed m/s	Walk distance (%) 0-2 m/s	Slow jog distance (%) 2-4 m/s	Running distance (%) 4-5.5 m/s	Distance in acceleration (%) 5.5-7 m/s	Distance in sprints (%) >7 m/s	Number of running bouts 4-5.5 m/s	Number of acceleration and sprints >5.5 m/s	m/s	kcal
1	96	5 246	0.91	3 677 (70%)	1 416 (27%)	128 (2.4%)	25 (0.5%)		22	4	6.7	578
5	96	9 927	1.72	3 882 (39%)	3 804 (38%)	1 522 (15%)	520 (5%)	214 (2.2%)	128	56	8.7	1 079
3	96	8 889	1.54	3 342 (38%)	3 611 (41%)	1 358 (15%)	424 (4.8%)	154 (1.7%)	140	47	8.5	1 027
4	96	9 404	1.63	3 482 (37%)	3 902 (41%)	1 465 (16%)	458 (4.9%)	97 (1%)	149	53	8.1	1 117
2	96	2 11 543	2.01	3 088 (27%)	4 663 (40%)	2 265 (20%)	1 353 (12%)	175 (1.5%)	250	153	8.6	1 740
10	96	3 10 752	1.86	3 651 (34%)	4 808 (45%)	1 761 (16%)	457 (4.3%)	81 (0.8%)	153	58	7.8	1 017
28	96	9 339	1.62	3 768 (40%)	3 826 (41%)	1 143 (12%)	450 (4.8%)	152 (1.6%)	106	38	8.5	974
27	48	5 802	2.01	1 527 (26%)	2 211 (38%)	1 218 (21%)	710 (12%)	143 (2.5%)	103	62	8.5	711
15	96	1 11 690	2.03	3 253 (28%)	5 395 (46%)	2 014 (17%)	830 (7%)	198 (1.7%)	161	80	8.6	1 277
13	70	8 668	2.03	2 753 (32%)	3 607 (42%)	1 356 (16%)	804 (9%)	149 (1.7%)	119	88	8.6	1 090
9	81	8 685	1.80	2 976 (34%)	3 450 (40%)	1 451 (17%)	656 (7%)	186 (2.1%)	125	68	8.4	1 141
17	48	5 820	2.01	1 494 (26%)	2 334 (40%)	1 406 (24%)	499 (9%)	95 (1.6%)	105	52	7.8	689
16	25	2 738	1.80	777 (28%)	1 048 (38%)	439 (16%)	376 (14%)	106 (3.9%)	28	30	8.4	337
19	15	1 573	1.65	477 (30%)	541 (34%)	275 (17%)	243 (15%)	37 (2.4%)	18	17	8.0	219

Fig. 3. The number of players who travelled over 10 km in Game 1

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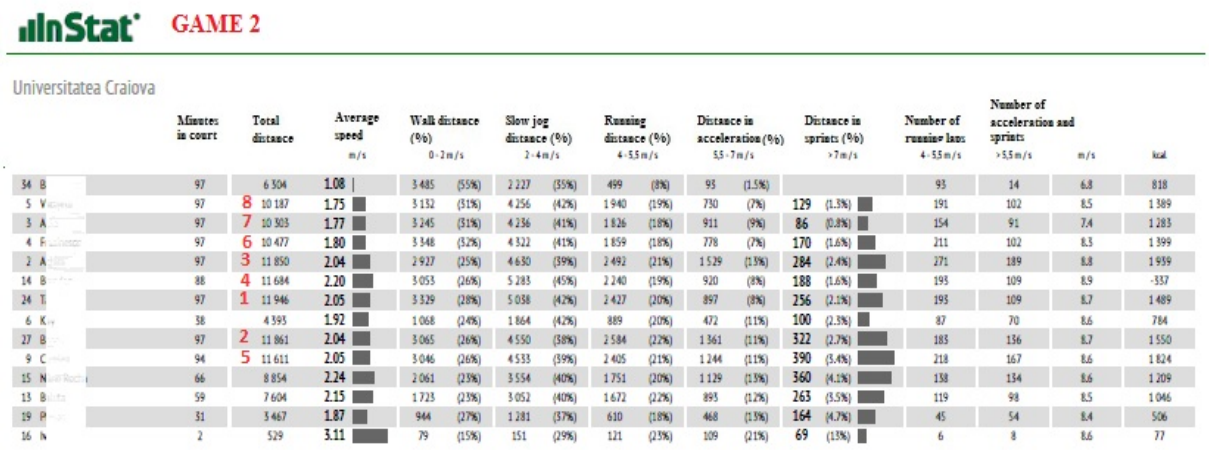

InStat GAME 2

Universitatea Craiova

		Minutes in court	Total distance	Average speed m/s	Walk distance (%) 0-2 m/s	Slow jog distance (%) 2-4 m/s	Running distance (%) 4-5.5 m/s	Distance in acceleration (%) 5.5-7 m/s	Distance in sprints (%) >7 m/s	Number of running bans 4-5.5 m/s	Number of acceleration and sprints >5.5 m/s	m/s	kcal
34	B	97	6 304	1.08	3 485 (55%)	2 227 (35%)	499 (8%)	93 (1.5%)		93	14	6.8	818
5	V	97	8 10 187	1.75	3 132 (31%)	4 256 (42%)	1 940 (19%)	730 (7%)	129 (1.3%)	191	102	8.5	1 389
3	A	97	7 10 303	1.77	3 245 (31%)	4 236 (41%)	1 826 (18%)	911 (9%)	86 (0.8%)	154	91	7.4	1 283
4	F	97	6 10 477	1.80	3 348 (32%)	4 322 (41%)	1 859 (18%)	778 (7%)	170 (1.6%)	211	102	8.3	1 399
2	A	97	3 11 850	2.04	2 927 (25%)	4 630 (39%)	2 492 (21%)	1 529 (13%)	284 (2.4%)	271	189	8.8	1 959
14	B	88	4 11 684	2.20	3 053 (26%)	5 283 (45%)	2 240 (19%)	920 (8%)	188 (1.6%)	193	109	8.9	-337
24	T	97	1 11 946	2.05	3 329 (28%)	5 038 (42%)	2 427 (20%)	897 (8%)	256 (2.1%)	193	109	8.7	1 489
6	K	38	4 393	1.92	1 068 (24%)	1 864 (42%)	889 (20%)	472 (11%)	100 (2.3%)	87	70	8.6	784
27	B	97	2 11 861	2.04	3 065 (26%)	4 550 (38%)	2 584 (22%)	1 361 (11%)	322 (2.7%)	183	136	8.7	1 550
9	C	94	5 11 611	2.05	3 046 (26%)	4 533 (39%)	2 405 (21%)	1 244 (11%)	390 (3.4%)	218	167	8.6	1 824
15	N	66	8 854	2.24	2 061 (23%)	3 554 (40%)	1 751 (20%)	1 129 (13%)	360 (4.1%)	138	134	8.6	1 209
13	B	59	7 604	2.15	1 723 (23%)	3 052 (40%)	1 672 (22%)	893 (12%)	263 (3.5%)	119	98	8.5	1 046
19	P	31	3 467	1.87	944 (27%)	1 281 (37%)	610 (18%)	468 (13%)	164 (4.7%)	45	54	8.4	506
16	N	2	529	3.11	79 (15%)	151 (29%)	121 (23%)	109 (21%)	69 (13%)	6	8	8.6	77

Fig. 4. The number of players who travelled over 10 km in Game 2

4. Discussions and conclusions

The program application over the 7 weeks has led to significant increases on all planes in Game no. 2, as follows:

- total travelled distance has increased by 9.9% ;
- the running distance at a speed of 4 to 5.5 m/s has increased by 30.9%, and the number of actions at this speed has increased by 30.9%;
- the running distance at a speed of 5.5 to 7 m/s has increased by 48%, and the number of actions at this speed increased by 65%;
- the running distance at higher speed, 7 m/s, has increased by 55%, and the number of actions at this speed has increased by 97% ;
- the number of players covering more than 10 kilometres has increased from 3 players to 8 players.

Based on these results, it is confirmed the research hypothesis.

As a result of the correct interpretation of data provided by the analysis system, it can be found a pattern to reach and maintain an optimal sportive shape, in order to ensure superiority over the opponent, from the physical point of view.

Permanent individualization of the preparation process is decisive within a weekly cycle, because not all the athletes react identically to the training stimuli, reaching some effort zones undesirable for that training, and thus disturbing the preparation process in the next weekly cycles of the competitive period.

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