



CONTRIBUTIONS TO THE PHYSICAL TRAINING SPECIFIC TO JUNIORS “A” INSIDE MODERN FOOTBAL

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Key words: efficiency, capacity, resistance, football, specific physical training.

The purpose of the present paper: The research undergone underlines the importance of physical training when talking about the junior football players A obtaining superior performances both in the training as in the official games. The physical training is in modern football one of the basic components systematically acting along with the other units of sport preparation.

Improving the physical training of football players in general and further more that of the A junior football players influences the technical-tactical preparation, as well as that of their biological and psychological preparation, taking into consideration the extremely rough demands and characteristics of the modern football.

In this regard, junior A football players will have a better effort capacity and will adapt correspondingly to the specific effort of the internal and international competitions, their general and specific training forming a positive mixture.

The research objectives are the following:

- The scientific documentation of the special field of interest literature as well as that of the inter-disciplinary literature from the point of view of the approached problematics;
- Discussion of the research aspects with the main trainer of the experiment team, with the trainers of the control team and with the players of the two A junior teams;
- Establishing the preparation and performance objectives of the team under study;
- Establishing the measurements, trials and tests used in the realized experiment;
- Setting the organizing stages of the experiment;
- Making the final measurements and applying the established tests and trials (initial tests, intermediary tests and final tests);
- Leading, observation and registration of the physical trainings of the experiment team;
- Registration of the official games of the 2006-2007 championship (match) and 2007-2008 (rematch) of the junior A team –FC Arges Pitesti;
- Programming, planning and applying the action systems inside the physical trainings of the team under study, with a view to improving the physical preparation of the Junior A players;
- Centralizing the data obtained by measuring, trials and tests effectuated on the players;
- Analysis and interpretation of the research results;
- Elaborating of the general and final theoretic conclusions, as well as of the proposals following the experimental endeavor.

The research premises and hypothesis:

The research was based on the following **premises**:

- Reaching the performance objectives in Romanian modern football at the level of A junior players is not possible without an objective spread of information, which is also to be a continuous one and always with a scientific base;
- The physical preparation is a basic component of the training process of junior A players of performance football, mainly influencing the other components, more specifically, the technical, tactical, biological and psychological preparation;

- The optimal development of the motric qualities (combined and of coordination) specific to the football players decisively contributes to the increase of their performances, both in the preparation process, as in the official games;
- Optimizing the general and specific physical training of junior A performance players determines the qualitative improvement of their technical-tactical activity undergone during the official games (performance behavior).

Starting from these premises we have established the following **hypothesis** for our research:

1. The fact that during the experimental team training specific and rationalized means are used, these methods being standardised and optimally planned in function of the preparation periods and the players' particularities, is a fact that will improve their physical preparation and implicitly increase their performance during official games and instruction trainings;
2. Optimising the general and specific preparation of junior A football players contributes to the improvement of their effort capacity and to the efficient adjustment to the specific effort of the training process and official games;
3. The research made will determine the selection of the priority motric qualities in the process of optimisation of the junior A football players' physical preparation.

The research methods used:

During the paper and experiment elaboration we have used the following research methods:

- The study of the special field of interest literature and of the curricula;
- The pedagogical observation;
- The questionnaire method;
- The experiment method;
- The statistical-mathematical method.

The unfolding of the experiment:

The experiment took place inside the FC Arges club, under the guidance of teacher /Coach Mihai Ianovschi ; two different junior A groups participated, these being also participants in the Republican Championship. The application of the work curricula only took place for the experiment group, encompassing algorithms of significant improvement of the effort capacity, their results being compared to those of the control group, which physically trained only by the means specific to the football game at the level of the A junior players.

Trials for measuring the specific physical training of football players

In order to measure the motricity characteristic to the football game, the following specific trials have been selected:

Maintaining the ball in the air without moving, by use of the leg and head (MML)- for the ball sense and control, as well as the level of the technical artness. The player maintains the ball in the air (without touching the ground) by hitting it with both legs. The number of exercises done in 30 seconds is the one that is registered.

Maintaining the ball in the air by displacement and by use of the leg and head (MMD)-for the ball sense and control, and the level of the technical artness. As well as for the previous trial, the difference consists of the fact that the sportsman moves while maintaining the ball.

The blow from 30 m distance (S_{30}) -for the hit force of the inferior limbs, precision, level of technical artness. The player pushes the ball forward (3m) and hits it from 30 m distance from the gate. The ball is at the ground level and must enter the gate without touching the field before the gate line. One can only hit fit a complete lace. Each player has the right at 10 executions form continuous running.

Going forward and backwards (N)-for strength and resistance under speed régime.

Description: the player moves in lateral running with a forward-backwards step on 5,5 m (on the gate line), followed by normal running forward-backwards over 16,5 m (from the gate line until the end of the penalty surface).

Head-hitting the ball (LMC)- for resistance under speed, precision and technical artness regime.

Means for developing the strength and specific resistance:

1. Slightly inclined running 800-1000m, 6rep, p1'30", I 80%;
2. Running series on a distance of 800-1000m, I 70-90% and breaks between 30-60";
3. Running series on 8x200m și 8x100m with breaks between 1-2', I 80-90%;
4. Running with a charge of 15kg, on 50m distances, I 70%, 4 series, p2';
5. Running on a non flat surface, followed by running on a flat surface -8seriesx50m, p1'30", I 80%;
6. Series of 10x50m running on a slope p1', I 80%;
7. Running series on 400-800m, with breaks of 30-90", I80-90%
8. 3'running, I 75%, 3series, p60";
9. Race running over 1600m, 2series, p3-4';

10. Passing the ball as in a real contest, with leading the ball on 50 and 100m, 4series, p1’;
11. Leading the ball 50m forwards-backwards with gate finalizing, 4seriesx5rep, p2’, I 80%;
12. 1x1 gate game, 3 alternate attacks per player; after each series, passes from one of the players to the other until the center of the field and the exercise is continued 4rep, p2’, I 80-90%.

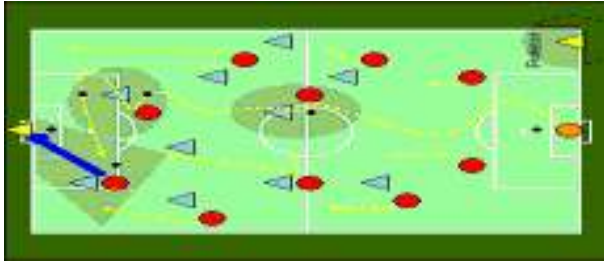
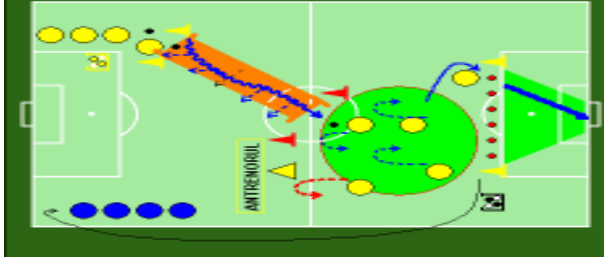
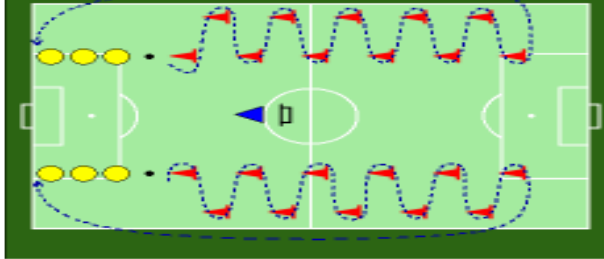
Technical-tactical means for the specific physical preparation

1. Maintaining the ball in air by alternative leg, thigh, head hits; after 4-5 executions a self-pass is done, so that the ball can be sprint reached before touching the ground; next, one will execute:
 - a) ball interception through amortization followed by ball lead for 10m;
 - b) ball interception by sending it back and change of the movement direction by 90°
 - c) ball interception through amortization or by sending it back, 10 m of leading it and gate shooting, 4x2’, p30’’, I 80%;
2. Pairs of players seated on the sides, at a 2meters distance; one of them moves forward quickly leading the ball towards the gate, while the other one tries to intercept the ball by lateral and back sliding, - alternatively, 10rep, p30’’, I 85%;
3. Passes in two over 30 m with exchanging places until close to the penalty area, where the player in possession of the ball stops it (by stepping on it), and his partner shoots at the gate-alternatively, 8 rep, p15’’, I90%;
4. Leg and head finalizing of centralized passes from both sides of the attack direction, with an active adversary, in conditions of numeric inferiority and superiority; 12 rep(10 by leg and 10 by head), p30’’, L 90%;
5. One player shoots from the side of the penalty surface, the other one runs among 4 marks situated at one m distance between one another, executes one jump with rolling forwards over a tall gate of 1 m and closes with the help of the head, with his leg opposing an active adversary-10 rep(5 by head and 5 by leg), p30’’, L90%;
6. Leg closure from outside the penalty area, for ball catching or deviation by the goalkeeper; one works rapidly-10 rep, p30’’, I 95%;
7. Center passes from the sides of the field for catching or sending the ball towards the goalkeeper inside the penalty area, in situations of 1x1;2x2;3x3;4x4-alternatively, 4x10 rep, p10’’, I90%;
8. One of the middle field players from near the penalty area sends the ball to the counter-attack pick; the ball is now led on the attack direction up until 20-25 m distance from the opposite gate and the action ends while the player is followed by an active opponent; the other counter-attack pick moves in the eventuality of receiving passes-10 rep each; p1’, I95%;
9. The goalkeeper gives the ball back to the left (right) middle field player by head and leg use; this player takes over the ball and passes it to the one of the attack picks; this one will lead the ball towards the opposite gate, having to fight an active opponent to finalize-10 rep, p1’, I95%;
10. On a 50x40m field a rapid ball lead from the gate line to player B is conducted; player B will shoot for the gate, finalizing from 15-20 m from the gate, after dribbling and avoiding player A who comes to meet him immediately after the rapid leaving of the opposite gate; after each execution the players direct themselves to the group opposite to the one they left from-10 rep, p1’30’, I 90%;
11. Technical-tactical exercise finalized with a successive gate hit from dribbling, a dribbling under the form of 1x1;2x2;3x3 game over a 30x15m field with proper gates protected by gatekeepers; the purpose is that of a rapid alternation of tasks between players-10rep,2x5,p1’, I95%;
12. Player A leads the ball along the margin line of the field, by dribbling among 10 poles situated at 1,5m distance one from another; having reached the gate line, he centers back to player B who tries to finalize from the penalty surface, being held by an active defender-10rep, p30’’, I 85%;
13. 2 rows of players are situated on the circle from the center of the field, in a lateral position from it, facing, at a 20m distance, one active defender; the attacker shoots at the gate from a 25-30 m distance, following a quick dribbling-10rep (5 with each leg),p30’’, I 90%;
14. Two teams are placed at the middle of the field, 4 players each (plus the goalkeeper) and they are trying to intercept the ball for scoring; the 4 field players of each team are helped by 2 team players seated outside the lateral lines of the field-2x15,p1’, I90%;
15. The game is played at 2 gates protected by goalkeepers, on a 15x30 m field; each team is formed of 3 players; the game is played in 2-3 passes, with man to man blockage; the goal is valid only if it is scored in vole or demivole, from a team colleague’s pass-2x4’, p1’, I95%;
16. Thematic game-2x15’, p1’, I90%;
17. School game-2x30’, p5’, I 80%;
18. Check game-2x45’, p10’, I 100%.

Example of specific physical preparation program

UNIT NO	THE TECHNICAL –TACTICAL DESCRIPTION OF THE TRANSPOSITION PHASE OF THE FORCE SPECIFIC TO THE FOOTBALL MOVEMENTS	THE GRAPHIC REPRESENTATION OF THE TECHNICAL-TACTICAL SCHEME
1.	<p>At a signal, the players will move in parallel on both sides in a 30 m run, receiving the ball from the lateral pass of a team colleague placed at 20 m left and right, then leading the ball along the field marks over a 40 m distance ; what follows is a low pass to a team player from a fixed area, after which he runs on the sides and seats himself at the line of the opposite row.</p>	
2.	<p>70 m running with the ball at one’s foot, the ball being led only by the help of the exterior lace; the player starts from the corner opposite to the 16 m square, engages between the two field marks placed at a 2 m distance one from the other, and shoots at the gate only by means of the full lace; the ball is sent into the gate, based on the stress fond following the specific plyometric effort of the inferior limbs; the player continues to run behind the gate and places himself at the end of the adversary line, in order to lead the ball and shoot with the other leg now.</p>	
3.	<p>30 m diagonal running towards the center of the field, gaining possession of the ball by lateral interception of a pass from the coach, ball leading for 30 m in a launched tempo; at the distance of 16m, the player goes around a fix field mark, on the left or right side of the footballer, in function of the leg selected for finalizing; the next stage is that of shooting with the entire lace into one of the lateral parts of the gate, on the center of which a fixed gatekeeper of a special material in the form of a player is situated; after finalizing, the player slightly runs to the opposite line;</p>	
4.	<p>After doing semi-flexions and jumped bows of a medium weight, one passes to sending the ball to a fixed diagonal point at a 65 m distance from the corner of the 16 m square, after which he immediately moves on the sides over the length of the square and executes 3 consecutive hits at a fix point (in the right upper corner of the gate), followed by the come-back to the own row, but in slight running.</p>	

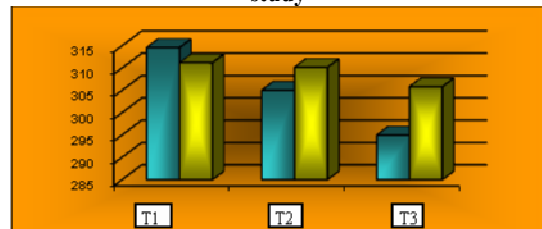
5.	<p>Dribbling among field marks placed on a special zig-zag trajectory and doing this only by a lateral but continuous move with the ball at one's leg, in the center of the field, the lateral passing of the ball to the coach being followed by the receiving it back and moving it forwards, dribbling it among field marks placed in a straight line up until the end of the 16 m square; the player is now sending the ball directly to the empty gate, but only by use of the less trained leg.</p>	
6.	<p>After doing the plyometric work specific to improving the inferior limbs force, the player launches into running, followed by a simple and then double dodging, going beyond the static field mark, but the dodge is only done with the less used leg; the coordination movement of the less used leg, but under tiredness and stress conditions following a plyometric training is worked upon.</p>	
7.	<p>Leading the ball from a running movement launched over the length of the field, doing the deceiving move (dodge)- simple, as well as double, with over passing two semi-active adversaries on the way to the gate, these adversaries simply encumbering but not intercepting the ball; one must add that the dodges are once done with the usually used leg and once with the less used one; the following action is that of going around a field mark situated at the corner of the 16 m square, finalizing in a gate shooting with the whole lace from a 16m distance into one of the lower corners of the gates that the coach mentions.</p>	
8.	<p>The coordination of a set of passes through lateral movement, among filed markers; one important aspect is that of the precise sending of the ball to a fix point, without interception and following the rhythm dictated by the coach in what passes from the team players from the circle area are concerned; the curbed red line represents the players' rhythmic displacement during passes based on lateral steps.</p>	
9.	<p>Take-off semi-flexions followed by immediate touches of the field markers with lateral movement and execution of jumped take-off-s on the left leg and then on the right one. The ball thrown by the coach is afterwards head-hit and sent into a fixed area.</p>	

10.	Football game from a position of support on palms and soles, by moving the body to the back based on clearly mentioned rules ; the players will move only by supporting themselves on their palms and soles, the ball will be only leg-hit and if the ball touches the arms, there is no henz declared ; the players will not be permitted to pass the ball or score by using their hands.	
11.	Coordination trajectory as shown in the near graphic ; it is done after the muscular and coordination exercises are finished ; it starts with keeping the ball in the air (by use of both legs and thighs) through a tunnel made of field markers ; the tunnel is made by the coach or physical trainer of the team, and the next rule is to be respected :the ball does not have to drop until the end of the line ; the player then enters a large area and has to keep the ball in the air for 4 minutes, by appealing to any part of the body he wishes ; the trajectory continues with 6 consecutive leg hits from a 16m distance and directed to a fix point from the left or right corner or directly into the net.	
12.	Backwards moving among zigzag field markers, by shooting the ball with the lateral left or right sole towards backwards, in a tempo which increases progressively, upon coach request.	

Interpretation of the research data
The status of the statistical indices

1600m RESISTANCE RUNNING						
Experiment group			Control group			
	T1	T2	T3	T1	T2	T3
X	314,6	305	294,95	311,2	310,15	305,8
S	17,58	11,25	13,54	15,3	14,58	14,11
Cv	5,6	3,7	4,6	4,9	4,7	4,6

Comparative graphic regarding the values of the arithmetic averages in the 1600m resistance tiral for the teams under study



In what regards the 1600m resistance test at the experimental group, we may say that the averages of the registered results increased from T1 in the initial test to T3, for the final one. Between T1 (the pilot experiment) and T2 a difference of 1,5 sec was registered, while the difference registered between T3 and T2 (the actual experiment) was of 5,65 sec. As to the standard deviation of the control group, a smaller value was obtained at T2 compared with T1 –a difference of 0,72, while at T3 we noticed a smaller value than that of T2-a 0,47 difference , which represents a smaller spread (close to the value of the arithmetic averages). We may thus affirm that the results are significant, but this fact is yet to be demonstrated. The variability coefficient registers a higher value at T2 than in T1, the difference being of 0,2%, while for T3 the value is smaller than for T2: the

difference is of 0,1%. The results are significant, showing good homogeneity of the values obtained by the players.

The arithmetic averages obtained in function of posts at all three tests are the following :

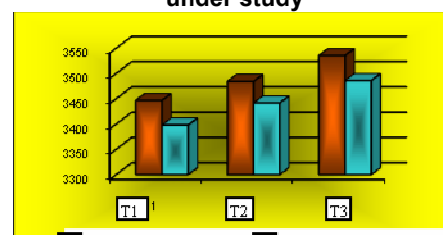
Average	Experiment group				Control group			
	P	F	M	Î	P	F	M	Î
T1	337,5	315,71	316,57	297,75	337,5	306,28	314,42	301
T2	325	309,57	300,71	294,5	335	304,57	314,28	300,25
T3	324	299	290,42	281,25	326,5	300,71	311	295,25

Legend: P-gatekeepers; F-back field players; M-middle field players ; Î-attackers

The status of the values of the statistic indices

	THE COOPER TESTUL					
	Experiment group			Control group		
	T1	T2	T3	T1	T2	T3
X	3446,55 Excellent	3484,05 Excellent	3535,2 Excellent	3398,05 Excellent	3441,45 Excellent	3485 Excelle
S	73,79	96,58	102,9	65,15	68,59	58,17
Cv	2,1	2,8	2,9	1,9	2	1,7

Comparative graphic regarding the values of the arithmetic averages in the 1600m resistance tiral for the teams under study



At the Cooper test for the experiment group, we may confirm that the averages of the registered results increased from the T1 initial test to the T3 final one. Between T2 and T1(the pilot experiment) a difference of 37,5m was registered, while between T3 and T2 (the proper experiment) we registered a difference of 51,15m. In what the standard deviation for the experiment group is concerned, we have obtained higher values for T2 in comparison with T1, the difference being of 22,79, the same aspect being also valid for T2 if compared to T3-a difference of 6,32 in favor of T3 is noticed. One other remarked aspect is that of the very high spread of the values of the arithmetic averages. As to the variability coefficient, this is greater for T2 in comparison with T1-at a difference of 0,9%, but for T3 the value is also higher than T2, the difference being of 0,9%. One can thus underline the good homogeneity of the values obtained by the players.

The arithmetic averages obtained on posts at al three tests are the following:

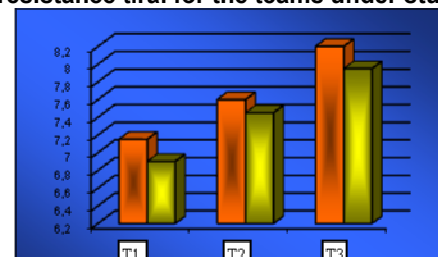
X	Experiment group				Control group			
	P	F	M	Î	P	F	M	Î
T1	3317,5	3403,14	3475,28	3536,75	3305	3385,57	3431,57	3407,75
T2	3395	3428,28	3511,85	3577,5	3325	3423,85	3464,28	3490,5
T3	3445	3457,43	3581	3636,25	3433	3462,14	3497,85	3532,5

Legend: P-goalkeepers; F-back field players; M-middle field players; Î-attackers

The status of the values of the statistical indices

	ŞUT DE LA 30 m					
	The experiment group			The control group		
	T1	T2	T3	T1	T2	T3
X	7,15- Bine	7,6- Bine	8,2- Bine	6,9- Mediu	7,45- Bine	7,95- Bine
S	0,87	0,88	0,83	0,71	0,75	0,68
Cv	12,2	11,6	10,2	10,4	10,2	8,6

Comparative graphic regarding the values of the arithmetic averages in the 1600m resistance tiral for the teams under study



For this test, the experiment group registered results averages which rose from the T1 initial test to the T3 final one. Between T2 and T1 (the pilot experiment) a difference of 0,45 goals was written down, while between T3 and T3 (the actual experiment) a difference of 0.6 goals was registered. With regards to the standard deviation of the experiment group, we have obtained a higher value at T2 in comparison with T1-a difference of 0,01, while for T3 the value was smaller if compared with T2, the difference being that of 0,05. A small spread

of the values of the arithmetic averages is noticed. The variability coefficient is smaller for T2 in comparison with T1- the difference is of 0,6%, while at T3 the value obtained was smaller than for T2:the difference was of 1,4% One notices an average (relative)homogeneity of the values the players obtained in T1 and T2 and a good homogeneity for T3.

Final conclusions:

- The general and specific physical preparation has major implications in determining and reaching the demands of the modern sportive football training (junior A).
- As to the physical condition of the (junior A) football players, the modern game is noticed for the fact that a player runs in between 8 and 12 km all throughout one game.
- In function of the distances ran by the football players, the following percentages can be reached: 40% - distances up to 10 m; 10% - distances of 10-12m; 25% - distances of 12-20m; 15% - distances of 20-30m; 10% - distances of over 30m.
- Taking place on a field of gret dimensions, football imposes the complete use of some movements which are also specific to other sport disciplines, such as athletics; these moves must be adapted to the game requests: the accelerated running, the speed running; the relaxed running, the basic jumps, the leaped step, as well as the jumped one, various combinations between running and jumping, the two hands throw from an above head position.
- Under the conditions when the space is considered as the background of the attack and defense game actions, as well as that of the football specific and not so very much specific movements, we can say that time, though limited- 2 reprises of 45 minutes each, represents the progress factor, performance determinant (the circulation speed of the ball and players, the number of actions).
- In function of the total distance covered during the time of the game (globally and on posts) and the way of covering it one can deduce the intensity of the non-specific movements from during the game for the team players specialized on different posts:

Nrc rt	Team role	Small intensity	Sub-maximal intensity	Maximal intensity
1.	Attacker	66%	21%	13%
2.	Middle field player	67%	22%	11%
3.	Lateral back field player	71%	19%	10%
4.	Central back field player	68%	21%	11%

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