

The effectiveness of the competitive implementation of archery in the preparatory period

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 Dr. Hab., Associate Professor **L.V. Tarasova**^{1,2}

 PhD, Professor **Yu.N. Shilin**³

 PhD **P.Yu. Tarasov**⁴

 PhD, Professor H-T. D. Gombozhapova⁵
¹Federal Scientific Center of Physical Culture and Sport (VNIIFK), Moscow

²Moscow Region State University, Mytishchi, Moscow Region

³The Federal Training Sports Center of the Representative Teams of Russia, Moscow

⁴Russian State University of Physical Education, Sports, Youth and Tourism (SCOLIPE), Moscow

⁵Buryat State University named after D. Banzarov, Ulan-Ude

Corresponding author: tarasova1708@mail.ru

Abstract

Objective of the study was to evaluate the effectiveness of athletes' sports implementation at the beginning of the preparatory period.

Methods and structure of the study. The work is based on the study and analysis of the protocols of competitive performances of archers at the Russian winter championship. Mathematical methods for calculating the obtained data were used: calculation of Student's t-test and coefficient of variation.

Results and conclusions. The work performed indicates the heterogeneity of the technical readiness of the top three leaders of the Russian championship. It is noted that the average results of the top three leaders of the first round are lower than the average results of the leaders of the second round of the qualifying round, which indicates a different level of special preparedness of athletes, both in men and women.

Passing the second round of the qualifying round requires the manifestation of special endurance, which indicates the need to maintain it among the leaders of the first round. On the contrary, insufficient implementation in the first round of the leaders of the second round indicates an insufficient level of "training", which requires a longer warm-up before entering the start of the qualifying round.

Keywords: archery, winter program, technical readiness, competitions.

Introduction. The competitiveness of athletes in competitions is a key factor in sportsmanship, the success of which depends on the qualitative contribution of their physical fitness [1-3].

Sports performances of archers in winter championships allow assessing the quality level of their implementation during the preparatory period, determining the vector of training impacts in the training process management system of the main competitive season.

The winter archery program differs from the summer 18 m distance, held in a closed hall. Athletes shoot twice at a distance of 18 m, according to the sum of which points are calculated (qualification round). Archers then perform individual pair shootings, which are scored according to the best hit from the three series.

Taking into account the short length of the distance in the winter program of performances, the center of

the target is limited to a hole of the maximum value of 10 points.

Evaluation of the effectiveness of sports performances at the winter championship allows you to evaluate the density of the results of the leading team, the accuracy of hits, their variability and the level of their technical preparedness.

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Results of the study and their discussion. The winter program of sports performances of athletes is

focused on the assessment of special preparedness within the preparatory period before the summer archery program.

44 teams took part in the Russian championship, with a total of 213 athletes, including 122 men and 91 women. The performances of the athletes were ranked in accordance with the passage of the first and second distances of 18 m of the qualifying round, the sum of points, the total number of holes of the highest value of 10 points and 9 points. Individual performances of athletes were ranked according to the results of passing sets and final firing.

The results of sports performances were studied according to the protocols of the competition (the first 32 places). The report presents the results of evaluating the effectiveness of the competitive activity of the qualifying round (men and women) (Table 1).

The coefficient of variation of the considered amount of points during the passage of the qualifying round is more pronounced in women, in whose group the greatest variability is noted in holes corresponding to 10 and 9 points, which is reflected in the reduced accuracy of their hits. Also noteworthy is the pronounced variability of a 9-point hole in men, which is 1.2 times higher than in women (22.9% and 18.3%, respectively), which also reflects the low stability of hits.

Based on the results of the qualifying round, the effectiveness of the competitive performances of the first three leaders for men and women of the first and second rounds of the qualifying round at a distance of 18 m was assessed (Table 2).

An analysis of the effectiveness of shooting at the Russian Championship in the qualifying round showed the following results:

- in men, the difference in the performance of the three winners of the first and second rounds (at a distance of 18 m), on average, was 0.7 points (296.7±0.6

vs. 296.0±0), while in the first round of passing the distance the reliability of hits was noted only after the 11th participant of the competition (t=4.4), and in the second round the reliability of hits was noted after the 6th participant (t=4.0), which indicates an increase in the density of the results of the leading team during the second round of the distance ;

- for women, the difference in the performance of the top three winners of the first and second rounds (at a distance of 18 m), on average, was 2.0 points (292.0±2.0 versus 294.0±1.0), while in the first round of passing the distance the reliability of hits was noted only after the 14th participant of the competition (t=2.1), and in the second round the reliability of hits was noted only after the 17th participant (t=2.0), which indicates a low density of the results of the leading women during the second distance circle;

- the dynamics of the amount of hits in men showed a high density of the results of the first 13 participants, as evidenced by the reliability of the differences in the analyzed result (t=3.1);

- in women, the dynamics of the amount of hits showed a low density of results, as evidenced by the reliability of differences in the analyzed indicators after the 24th participant of the competition (t=5.0);

- in men, the total number of holes with a value of 10 points only after the 17th participant indicates their significant difference (t=4.8);

- in women, the difference in the total number of holes, worth 10 points, already after the 10th participant has a significant difference (t=3.0).

The leading positions of the first three winners of the qualifying round indicate the heterogeneity of their special preparedness, as evidenced by the indicators of the first three positions of the first and second rounds at a distance of 18 m (Table 3).

Table 1. Protocol of sports performances of men and women

Indicators	Distance		Sum of points	Hole, points	
	First round, 18 m	Second round, 18 m		10	9
Men					
X	291,2	291,7	582,8	44,0	14,8
σ	3,1	2,5	4,5	3,8	3,4
V, %	1,06	0,8	0,7	8,6	22,9
Women					
X	286,2	280,4	570,9	35,8	20,2
σ	5,3	21,9	7,9	5	3,7
V, %	1,8	7,8	1,3	13,9	18,3

Note: X - average value; σ is the standard deviation; V - coefficient of variation.

Table 2. Evaluation of the effectiveness of competitive performances of archery at the Russian Championship (winter program)

Indicators	Places				
	Men	Women			
Places by rank	$n_1=3$	$n_2=11$	$n_3=3$	$n_4=14$	
1 circle, 18 m	X	296,7	293,6	292,0	289,4
	σ	0,6	2,2	2,0	1,8
$p \leq 0,05$	t	4,4		2,1	
Places by rank	n = 3	n = 6	n = 3	n = 17	
2 circle, 18 m	X	296,0	294,8	294,0	277,8
	σ	0	1,0	1,0	32,8
$p \leq 0,05$	t	4,0		2,0	
Places by rank	n = 3	n = 13	n = 3	n = 24	
Final result	X	590,3	587,2	583,3	579,8
	σ	1,5	2,4	1,2	2,5
$p \leq 0,05$	t	3,1		5,0	
Places by rank	n = 3	n = 17	n = 3	n = 10	
The hole is 10 points	X	50,7	46,8	44,7	42,3
	σ	1,2	2,7	1,2	1,8
$p \leq 0,05$	t	4,8		3,0	

Note: X - average value; σ is the standard deviation

The results of the performances indicate a high density of hits in the top three, with men on average higher than women. It should be noted that the leaders of the qualifying round of the second round, both in men and women, showed significant differences in the greater direction ($t=4.5$ and $t=5.3$, respectively), which indicates the importance of the competitive implementation of the second round.

Conclusions. Evaluation of the effectiveness of sports implementation at the beginning of the preparatory period made it possible to determine the lead-

ing and limiting indicators of the special preparedness of archers based on the results of competitive implementation.

The performed study indicates the heterogeneity of the technical readiness of the top three leaders of the Russian Championship, the difference in indicators of which differs between the first passage of a distance of 18 m and the second.

It is noted that the average results of the top three leaders of the first round are lower than the average results of the leaders of the second round of the quali-

fying round, which indicates a different level of special preparedness of athletes, both in men and women.

Passing the second round of the qualifying round requires the manifestation of special endurance, which indicates the need to maintain it among the leaders of the first round.

On the contrary, insufficient implementation in the first round of the leaders of the second round indicates an insufficient level of "training", which requires a longer warm-up before entering the start of the qualifying round.

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Table 3. Difference in the indicators of the leaders of the qualifying round when passing the first and second rounds of the 18 m distance

Leaders of the first circle of the qualifying round				Leaders of the second circle of the qualifying round			
Place	Result	Place	Result	Place	Result	Place	Result
first circle		second circle		first circle		second circle	
Men							
1	297	4	295	18	291	1	296
2	297	36	287	28	289	2	296
3	296	5	294	8	293	3	296
X	296,7	-	292,0	-	291,0	-	296,0
σ	0,5	-	4,4	-	2	-	0
t	1,9			4,5			
Women							
1	994	12	288	7	289	1	295
2	992	8	289	13	290	2	294
3	290	2	294	19	287	3	293
X	292,0	-	290,3	-	288,7	-	294,0
σ	2,0	-	3,2	-	1,5	-	1,0
t	0,8			5,3			