88 - IMPROVEMENT OF ENDURANCE IN PREPARING THE BIATHLON SKI TESTS THROUGH MEANS SPECIFIC TO ATHLETICS AT JUNIOR II LEVEL

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INTRODUCTION

In biathlon ski, endurance is the one that determine or delimite the progress of the performance.The endurance has an aerobic character,but with the appearance of the skating step(sprint) the anaerobic effort increase.By implementing the sprint event in biathlon,the alactacid component had a substantial increase.

In biathlon, the motor capacity is 65%,the mental capacity 20% and the somatic type 15%(Pelin,F.,2001).

Distribution of the capacity of a biathlete Table 1

Motor capacity	Mental capacity	Somatic type	%
65 %	20 %	15 %	100 %
Endurance 50 % ↓ Expansion -Speed 30 % ↓ Skill 20 %	Stoutly 55 % ↓ Combativeness –will 25 % ↓ Persevereance 20 %	Waist – weight 60 % ↓ Proportion -segments 25 % ↓ Waist 15 %	
100%	100%	100%	

Depending of the different distances, the percentage of aerobic and anaerobic energy show up like this:

Percentage of aerobic and anaerobic energy Table 2

Distance	100 m	200 m	400 m	800 m	1.000 m	1.500 m	5.000 m	10 km.	30-50 km.
AEROBIC	5/4%	10/6 %	25/8%	45/30 %	50%	65/49 %	90/73 %	95/87 %	99/92 %
ANAEROBIC	95/96 %	90/94 %	75/92 %	55/70 %	50%	35/51 %	10/27 %	4/13%	1/8%

The percentage of intervention of the aerobic and anaerobic capacity during different type of effort:

Percentage of intervention of the aerobic and anaerobic capacity Table 3

Working time	Up to 20 sec	Under 40 sec	1 – 8 min.	Over 8 min.
AEROBIC	0 – 5	20	20 - 80	80
ANAEROBIC	90 – 100	80	80 – 20	20

ENDURANCE AND ANAEROBIC THRESHOLD

Maximal oxygen consumption provides significant data on maximal aerobic power, but is also very useful to know the percentage of the power used by athletes in the long-term benefits.

Hence the need for adequate knowledge of the concept of "anaerobic threshold".Designates, generally, the transition to power the anaerobic mechanism intervenes and lactacid. Metabolic level, there is a proper threshold (production of lactic acid with, on the one hand and the maximum production of lactic acid, on the other hand).

It is rather a progressive intensification of anaerobic activity (transition zone aerobic - anaerobic).

In reality, however, it comes to determining a certain amount of work (anaerobic threshold), from which the accumulation of lactic acid, which quickly leads to muscle wasting. If the training is successfully delaying this accumulation, the possibility of bearing longer earn a higher workload in practice; This means that without increasing VO2 table can exploit a greater percentage of it for a period of time.

The performance gives background evidence today are the result of using optimal training intensity.

Research has confirmed that the optimal intensity resistance training exercise in the intensity is not formed at all lactate accumulates in a very small amount. It corresponds to the so-called threshold aerobic - anaerobic and is characterized by lactate concentration as in the blood of about 4 ml. mol / liter.

Heart rate in an effort aerobic-anaerobic located in the range between 150-180 (Pelin,F.,2007).

Defining characteristics of aerobic and anaerobic threshold Table 4

	AEROBIC THRESHOLD	ANAEROBIC THRESHOLD
Lactate	2 mmol/l	4 mmol/l
Heart rate	130 – 150	160 – 185
Maximum consumtion of O2	50 – 60 %	65 – 95 %

THE DEVELOPMENT OF ENDURANCE IN BIATHLON

The resistance is the most important quality for biathlon athletes characterized by body resistance to fatigue factor.

During this period, endurance develops both general and specific. The overall endurance develops with all included in the training exercise. It is the support on which specific endurance develops.

General endurance development is in the early stages of the period for beginners and juniors; it may take up to snow period ends.

The overall resistance develops primarily under the influence of exercises practiced long as:

·walking and running with small or medium speed;

·the running speed, the sand, the water;

·cycling, rowing and swimming;

·sports games, etc.

The increased volume and low intensity contributes to the general development of endurance.

Walking and running will run on varied terrain or forest. Running speed depends on the degree of training of the skier and the running distance. Beginner speed will be 6-7 min./1 km. - Women 7-8 min./1 km. And for advanced 5-6 min./1 km.

Running can be metered in time (ex. 30 "- 1 hr., Etc.) or km. (1-2-3-5-10 km.). It is good to do while dosing, indicating the number of km. need to be done.

Training to develop general strength will be executed at the end of the weekly cycle. During his time it will be interspersed with short acceleration portions,walking, gymnastics, jumping, stretching exercises, etc.

MEANS AND METHODS OF ENDURANCE DEVELOPMENT SPECIFIC TO ATHLETICS IN THE BIATHLON TRAINING PROCESS AT JUNIORS II- PREPARATORY PERIOD

Methods and numbers of trainings for preparatory period Table 5

Nr. Crt.	Methods	JUN	JUL	AUG	SEPT	OCT	NOV	TOTAL
1	Running intervals km	80	80	80	80	80	100	500
2	Running on time(4'40"-4'10"/km) km	76	80	63	98	106	70	493
3	Running time with uniform tempo(3'50-4'10"/km) km	40	42	46	52	58	38	276
4	Running short intervals km	8	6	6	6	8	6	40
5	Running long intervals km	10	8	8	12	14	10	62
6	Repeated running short portions km	14	12	10	12	12		60
7	Repeated running long portions km	10	10	9	6	10		45
8	Accelerated running km	4	4	4	4	4		20
9	Running launched km	10	10	10	10	10	8	58
10	Fartlek running km	16	16	16	16	16	16	96
11	Tempo runnning km	37	37	30	35	42	35	216
12	Special running exercises km	11	11	10	10	10	5	57
13	Competition and verification running km	6	6	6	6	4		28
14	Total km	322	322	298	347	374	288	1951

RESEARCH ORGANIZATION

The experimental research was conducted during June-November 2016.The place of the research was School Sports Dinamo Rasnov training facility located on Valea Rasnoavei,Rasnov,Brasov.

The sample investigated: consisted of athletes aged 16-18, juniors II in performance group CSS Dinamo Râşnov.

The experimental group was composed of 8 athletes registered with the group of performance Cristian 102 and control group 8 athletes to group 105 Zarnesti.

All 16 athletes are male and are within the age range 16 to 18 years and are registered with the School Sports Club Dinamo Râşnov.

The 16 athletes were enrolled in the experimental program recommendations based on acceptance of club coaches Gârniţă Nicolae and Pelin Gheorghe from CSS Dinamo Râşnov.

EXPERIMENTAL METHOD

This research attempts to assess the weight of the athletes specific means contribute to the development of endurance to biathlon athletes(Juniors II).

Experimental assumption: “treating the development and improvement of physical quality with the help of methods and means specific of athletics adapted to biathlon ski may lead to a significant increase of manifestation indicators and this physical quality and implicitly of sports performances growth”.

Independent variable: This is the specific athletics drive systems adapted to modern biathlon.

Dependent variable: It is represented by athletes seeking to develop the strength of the driving quality by applying independent variable.

The values of the dependent variable were obtained from the subjects made with the help of the measuraments of the test and control samples.

CONTROL TESTS1.Endurance running on varried field 2000m;

2.Endurance running on stadium 1000m;

3.Ski running(Roller-skiing) on varried field 3000m.

The time interval is timed from start to crossing the finish line and the result is recorded in minutes and secundes.We given a single try and record the result.

For the experiment was used a set of tests that were performed once at the beginning of the experiment and again at the end of this period.We followed the reaction of the experimental group at the athletic specific methods adapted at biathlon skiing used in the training process.

The initial testing was ocurred in 1st, 3rd and 6th of June 2018.

In order to assess objectively the development of the group during the experiment we used the same samples as we used at the initial test. Results were tabulated for a better view and to be accessible to achieving graphical form.

As with the first tests, final examinations were held during three days to avoid excessive fatigue of the athletes, otherwise can appear the possibility that the results are not conclusive.

It was intended to athletes to rest before the test day and no longer trainings were scheduled before. In the following table we present the final results, leaving the next section with graphical interpretation.

The final testing was ocurred in 25th, 27th and 30th of November 2018.

RESULTS

Table with the results of the initial test on experimental group Table 6

Nr. Crt.	Name and surname	Endurance running on varried field 2000m	Endurance running on stadium 1000m	Ski running(Roller-skiing) 3000m
1	G.M.	7'35"	3'12"	10'20"
2	M.C.	7'39"	3'18"	10'16"
3	V.A.	7'36"	3'20"	10'10"
4	G.R.	7'28"	3'07"	10'05"
5	A.D.	7'45"	3'21"	10'28"
6	O.C.	7'50"	3'21"	10'33"
7	G.A.	7'30"	3'12"	10'44"
8	L.L.	7'35"	3'15"	10'35"

Table with the results of the final test on experimental group Table 7

Nr. Crt.	Name and surname	Endurance running on varried field 2000m	Endurance running on stadium 1000m	Ski running(Roller-skiing) 3000m
1	G.M.	7'28''	3'08''	10'05
2	M.C.	7'35''	3'05''	10'02'
3	V.A.	7'30''	3'11''	9'54''
4	G.R.	7'27''	3'05''	9'50''
5	A.D.	7'38''	3'14''	10'14''
6	O.C.	7'44''	3'18''	10'30''
7	G.A.	7'28''	3'10''	10'12''
8	L.L.	7'29''	3'11''	10'22''

PROCESSING STAGE AND DATA INTERPRETATION

Presentation, processing and interpretation of results from the experiment were made by means of mathematical statistical. The statistical indicators which were used in processing and statistical interpretation of the results were: arithmetic average, standard deviation and coefficient of variation.

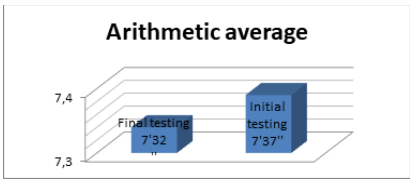
Experimental group-initial testing Table 8

Nr. Crt.	Event	Arithmetic average	Standard deviation	Coefficient of variation
1	Endurance running on varried field 2000m	7'37''	7.32 sec	1.6%
2	Endurance running on stadium 1000m	3'15''	5.11 sec	2.62%
3	Ski running(Roller-skiing) 3000m	10'23''	13.38 sec	2.14%

Experimental group-final testing Table 9

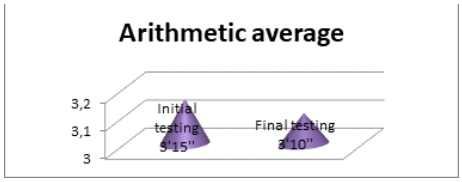
Nr. Crt.	Event	Arithmetic average	Standard deviation	Coefficient of variation
1	Endurance running on varried field 2000m	7'32''	6.06 sec	1.34%
2	Endurance running on stadium 1000m	3'10''	4.39 sec	2.31%
3	Ski running(Roller-skiing) 3000m	10'08''	13.59 sec	2.23%

Results of the tests-endurance running 2000m –varried field Chart 1



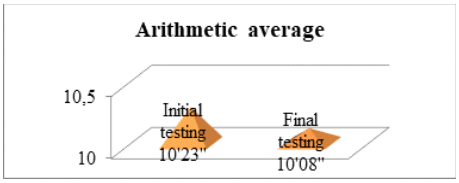
Endurance running on varried field 2000m-on this event we can see an improvement in the arithmedic average of the initial results.All subjects from the experimental group have increase their performances on the endurance running on varried field.In terms of homogeneity,both initial and final testing,is very good, the group being homogeneous with a value of 1,34% after the final testing.The arithmetic average improve, increase from 7'37"initial to 7'32"final.

Results of the tests-endurance running 1000m-stadium Chart 2



Endurance running on stadium 1000m-on this event in the initial testing the average of the experimental subject was 3'15" with a standard deviation of 5,11 sec.The coefficient of variation for the subjects from the experimental group was very good, 2,62%, the group been homogenous.At the final testing,the average of the experimental group is 3'10"and standard deviation of 4,39 sec.The coefficient of variation was improve to 2,31% and we can see a improvement of 5 secons at the arithmetic average to the initial testing.

Results of the tests-ski running 3000m-roller-skiing Chart 3



Ski running(rollers-skiing) on varried filed 3000m-on this event in the initial testing, the average of the experimental subjects was 10'23"with a standard deviation of 13,38 seconds.The coefficient of variation 2,14%, showing that the group had a big homogeneous level at the initial testing.On the final testing,the average increase with 15 seconds beeing 10"08" with a standard deviaton of 13,59 seconds.

CONCLUSIONS

After finishing the research, we made the following conclusions:

The current condition of training in Romanian biathlon doesn't allow the use of very expensive means or series of devices and simulators to improve athletic performance and eliminate downtime of tehnical training owe to anual structure of training process;

This urge is felt especially in the groups of childrens and youths where the foundations of sports performance is made, here feels acutely the need of implementing perform tehnologies in training, the use of athletic specific means to fill somewhow the need of tehnique study;

The methods addressed in the athletic training resulted in a significant increase in the physical training of the athletes and the results were seen in the control tests where you see a notable progress of the subjects.So is rejected the null assumption and is confirmed the research assumption;

For the preparation of juniors in biathlon is necesary a physical training or a perfection motor qualities specific to this sport with a higher procentage on endurance.

PROPOSALS

Following the research is necesary on Juniors training from School Sports Dinamo Rasnov to continue with the specific athletic training methods and means 3 times/week to develope a sports yield of big value;

This type of training in biatlon has to be continue monitorized by the coaches to avoid the secondary effects of overtraining like reducing muscle size and force, increase heart rate during the rest period,abnormally high blood presure,muscle joint pain and acute fatigue.To prevente these sympotms I propose that at this model of training to pay a greater attention to the use of vitamins to athletes, the use of food and a close supervision of the recovery methods.

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Abstract. The performances know today a vertiginous growth in all sports branches, firstly determined by the continuous perfection of methods and means of physical qualities improvement, their development process regarding the smallest details, in a unanimous opinion of the specialists.

Taking into account the morpho-functional and psychological peculiarities of the age group of 16-18 years (juniors II) to which the theme of the paper refers, we considered that the approach of physical training through means specific to athletics endurance at a higher level than the current training is always a hot topic in the biathlon skiers' training.

The training program I propose in the paper was selected and rationalized following the pedagogical observation activity on several groups of skiers within the Dinamo Rasnov School Sports Club. It was followed carefully the factors such as the

correlation between cardio-vascular parameters and the performance in endurance effort, the effects of endurance training for heart, the cardiac frequency of sportsmen, the effects of endurance trainings for lungs, breathing technique.

The purpose of this research is to experimentally determine the level of endurance improvement following the participation to a training program used through specific means of athletics adapted to biathlon ski.

Keywords:biathlon ski,athletic means specific,endurance effort,endurance in biathlon ski.