

# Structure and content of training of the qualified runners on middle distances in annual cycle of preparation

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**Purpose:** to develop and to confirm experimentally the efficiency of the program of one-cycle creation of the training process of the qualified runners on middle distances in annual cycle of preparation.

**Materials & Methods:** 40 qualified runners on middle distances took part in the research, 20 of which mainly lived in mountain conditions and 20 – mainly on the plain. The following methods were used during the research: analysis and synthesis of references, analysis of documentary materials, pedagogical observation.

**Results:** the structure of annual macrocycle of training of runners on middle distances with the use of trainings in mountain conditions is presented. Content of mesocycles of preparation, volumes and orientation of training loads at them are directed.

**Conclusions:** the correct and rational connection of means of training of runners on middle distances in mountain conditions and on the plain influences positively the level of preparedness and promotes the professional development of sportsmen.

**Keywords:** runners on middle distances, structure of macrocycle, means of training.

## Introduction

The modern level of the development of track and field athletics sport is characterized by the tendency to the steady growth of sporting achievements that involves the improvement of the theory and technique of sports training, the structure and the system of construction and the management of the training process, the search of new means, methods, forms and conditions allowing to open more stoutly potential opportunities of sportsmen.

One of the perspective directions, which are capable to make an active impact on the increase in functional reserves of organism of sportsmen and the growth of special working capacity, is trainings in the conditions of the mountain area [4].

Training in mountain conditions promotes the development of complex of the adaptive reactions providing the growth of special preparedness and creating conditions for the successful performance of sportsmen at competitions in the conditions of the plain [4].

The sports result in track and field athletics directly depends on the high-quality management of preparation of sportsmen and includes the rational structure and contents macro - meso - microcycles, ratio and distribution of training means in structural educations, the effective organization and holding the centralized educational training camps, the balanced power supply system and restoration, regular control of various parties of preparedness of sportsmen [3].

One of the effective methods of restoration of functional condition of sportsmen, the increase in their aerobic opportunities, physical efficiency and endurance, according to L. D. Lukyanova with coauthors (2008), is hypoxemic training.

Various methods of modeling of hypoxia – options of hypoxemic trainings are offered in a number of scientific works: long hours-long exposition of hypoxia (the model “train low, sleep high”); interval 2–6-hour exposition daily within 12–28 days; hypoxemic expositions in combination with exercise stresses [2; 8]. However most of experts consider that the most effective training is under natural conditions.

At the same time, it should be noted that we didn't almost reveal the works, reflecting the content of the educational-training process in year macrocycle of preparedness of the qualified runners on middle distances, being the closest reserve of the national team of the country. The single questions devoted to this problem were considered in the works of Wang Dai (2013), L. Ye. Shesterova, Tu Yanhao (2014, 2015), however they created only the general idea about the content of the training process.

### The purpose of the research:

to develop and to confirm experimentally the efficiency of the program of one-cyclic creation of the training process of the qualified runners on middle distances in annual cycle of preparation.

### Material and Methods of the research

The researches were conducted in People's Republic of China. 40 qualified runners on middle distances participated in the research, 20 of whom mainly lived in mountain conditions and 20 – mainly on the plain. Sportsmen trained according to the offered by us program, uniform for everybody.

The following methods were used during the research: analy-

sis and synthesis of references, analysis of documentary materials, pedagogical observation.

## Results of the research and their discussion

The analysis of scientific and methodical materials, own experience, features of the competition calendar and results of the factorial analysis allowed to develop the basic provisions of the program of the annual preparation of runners on middle distances with the use of trainings in mountain conditions. The annual macrocycle of training of the qualified runners on middle distances was under the construction on one-cyclic structure that assumed the existence of one, rather long, preparatory period, the competitive period, lasting 5 months, and the transition period. Considering the competition calendar and possibilities of sportsmen and training bases, preparation of sportsmen assumed the existence of 3 training sessions in midlands and highlands and one training session in the conditions of lowlands at the height of 800 m (tab.).

The content of mesocycles of training on the plain and in mountain conditions was developed taking into account the structure of the factorial analysis about the contribution of separate components to sports result. It should be noted that the training program of the sportsmen who are lived in various climatic conditions was identical. It is connected with the fact that the formation of the national team of China does not provide the division of sportsmen into groups now, depending on accommodation conditions.

At the same time, the analysis of records of China in types of endurance showed that only one third from them (3 of 9) belongs to the sportsmen, who live in the mountain area. And, it is records in run on 10000 m, marathon and sports walking on 50 km [7].

The all-preparatory stage of the preparatory period consisted of 2 mesocycles – involving and basic. Trainings in these mesocycles took place in conditions of the plain and were directed to the increase in functionality of organism and power of aerobic processes, the development of force of all muscular groups, strengthening of ligaments and sinews.

The involving mesocycle. Run volume in the aerobic mode made 280 km and was carried out with small and average intensity, generally it is uniform run under natural conditions. Run on pieces uphill of the small steepness, turning into run

on the plain, was applied to the improvement of take-off and preparation of the musculoskeletal system for trainings in mountains. Length of pieces did not exceed 200 m.

Sportsmen performed the large volume of special running exercises: tripping run, run with high lifting of a hip, run with lash of shins, run by jumps with emphasis on speed of take-off, run with high lifting of hip and lash of shins “wheel”, run on straight line with statement of feet to one line, run through objects or of marking for improvement of rhythm and length of steps. Kinds of run were carried out on pieces of 50–60 m, coming to the end with obligatory acceleration 30–40 m long.

The overall physical condition included exercises on the development of the physical qualities defining result of the competitive activity of sportsmen. Hopping exercises included: run by jumps with emphasis on flight phase, jumps from leg on leg with emphasis on performance speed, jumps on one leg with pulling up of take-off foot under buttock, jumps on two legs with their pulling up to breast, vaults, jumps through apparatuses and natural obstacles, jumps through jump rope on one and two legs, outleap from deep squat, threefold, quintuple, tenfold standing jump, etc. The exercises, which are aimed at the development of muscular strength of back, prelum abdominale, back and forward surface of hip, were carried out in couples, on apparatuses, trainers, with stuffed balls, expanders, bar etc. by the method of circuit training. The exercises, which are aimed at the flexibility development: elastic bendings, leg swings with big range, extension in couples, stretching. The total volume of the work, which is directed to the increase in overall physical condition made 20 hours.

Run volume in the aerobic mode made 330 km and was carried out with small and average intensity in the basic mesocycle of the all-preparatory period; generally it is uniform run under natural conditions.

The intensification of the training process was reached due to the increase in speed of run. Variable on pieces of 0,5–1,5 km and tempo – 3–5 km added to cross run on 20–25 km with speed up to 4.20 by 1 km. Run uphill and about mountains, jumps on soft soil joined. Hopping work uphill on pieces to 300–400 m with the subsequent running-off from the mountain practiced. All accelerations and rhythm jogs were carried out with speed, the corresponding speed of run at distance of 1500 m (for runners on 800 m) and 3000 m (for runners on 1500 m).

The structure of annual cycle of preparation of runners on middle distances

X	XI	XII	I	II	III	IV	V	VI	VII	VIII	IX
Preparatory period						Competitive period					Transition period
AP stage		SP stage				Stage DPMC		Stage of the main competitions			
Plain	Plain	Mountains (21 days)	Plain	Mountains (28 days)	Plain (7 days)	Lowlands (14 days)	Plain	Mountains (14 days)	Plain		

High-intensity trainings on the improvement of power abilities of sportsmen with the use of circular method were carried out three times a week. A lot of work for the development of fast force – to 30% of total amount of time, which is allowed for power preparation, was performed in this mesocycle.

The exercises, which are aimed at the flexibility development, presented in the involving mesocycle, were supplemented with exercises of “barrier school”.

In general OPC volume, as well as in the previous mesocycle, made 20 hours.

Specially preparatory stage of the preparatory period solved problems of the improvement of special aerobic opportunities in combination with anaerobic glycolytic; increases in ability to motive switchings.

The basic mesocycle of this stage of training passed in mountain conditions. The total amount of run made 430 km, of them in mountain conditions – 300 km. The duration of stay in mountains – is 21 days.

The main assets of training: cross run, which is aimed at the development and maintenance of the level of the general endurance; pace running on pieces of 3–4 km with speed of 3.10–3.25 by 1 km; variable run (fartlek), at the speed which is not exceeding 3.45 by 1 km.

Means of high-speed and power preparation, jumps, many-gallops, jumps uphill, run from the mountain and uphill, were carefully planned and not applied in large volume at once. It is connected, first of all, with conditions of holding trainings and possibility of functional overload of muscles of legs. The majority of trainings came to the end with accelerations and rhythm jogs at the speeds corresponding to run on 800 and 1500 m.

The volume of OPC decreased a little and made 15 hours.

The second basic mesocycle of the special-preparatory period was carried out on the plain. Problems of maintenance of the reached level of aerobic opportunities, increases in the level of high-speed preparedness were solved in it. The total amount of run made 500 km. Run volume in the blend mode, at the expense of pace and interval running on long pieces increased considerably. The number of the interval trainings held at the speeds corresponding to run on 1500 m and 3000 m increased (for runners by 800 and 1500 m respectively).

Practically all trainings came to the end with accelerations and rhythm jogs at the speeds corresponding to run on 800 and 1500 m. The volume of special running and hopping exercises remained the same.

OPC volume, remaining the same according to contents, decreased a little in comparison with the first basic mesocycle of the special-preparatory stage of the preparatory period.

The third basic mesocycle of the special-preparatory stage was carried out in mountain conditions. Sportsmen executed 380 km of aerobic running work for 28 days (4 weeks) of stay in conditions of midlands and highlands. It should be noted the substantial increase of volume of work in the blend mode

at the expense of pace and interval running on long pieces. And, not only the volume of work, but also its intensity increased. Run on pieces in the anaerobic mode was carried out in the conditions of highlands. Thus, ability to make the finishing acceleration in the conditions of the come hypoxia was fulfilled. The volume of special running and hopping exercises increased a little.

The volume of means of OPC decreased till 10 o'clock.

The control-preparatory mesocycle of the stage of direct preparation for the main competitions was carried out for the purpose of check of the level of preparedness of sportsmen to conditions of the competitive activity. Sportsmen participated in two competitions of All-China scale. Their preparedness for display of result for 2–3 day and in 21 days after descent from mountains was checked.

14 days of this mesocycle sportsmen trained at the height of 800 m above the sea level. The volume of the performed work in the aerobic mode made 240 km. Much attention was paid to the increase in high-speed abilities both due to run in the anaerobic mode, and due to the exercises of the all-preparatory character. Hopping work uphill on pieces to 600–800 m with the subsequent running down from the mountain was performed every week.

Sportsmen participated in competitions which had a control character after descent to the plain. The amendments, which allowed optimizing training of sportsmen for the main competitions of season, were introduced in the training process on the basis of results of the competitive activity.

Run volume in the aerobic mode on the plain made 500 km. Against the background of large volume of aerobic work runners performed 35 km of run in the mixed zone (interval run on long pieces) and 15 km of run in anaerobic zone (repeated run on short pieces). At the same time strengthening of the musculoskeletal system due to hopping and power exercises continued, the technique of run by application of special running exercises and exercises of “barrier school” was improved.

Trainings came to the end with accelerations and rhythm jogs at speeds higher than the speeds of run on 800 and 1500 m.

Sportsmen participated in competitions, but special preparation for them was not carried out in 21 days after descent from mountains.

Problems of the improvement of aerobic and anaerobic opportunities, increases in the level of the development of special endurance, the improvement of technique of run and tactical skill were solved in the precompetitive mesocycle. The mesocycle was subdivided into two parts – 14 days of training were spent in mountain conditions and as much in the conditions of the plain. Trainings took place in mountain conditions at heights corresponding to midlands and highlands. Run volume in mountain conditions in the aerobic mode made 230 km. Trainings, generally anaerobic character were held on highlands. The training process joined the work of the repeated character modeling run conditions on 800 and 1500 m. Accelerations on 30–80 m with the subsequent free running to complete recovery were carried out in cross-countries. Sportsmen participated in competitions of All-China scale after the descent from mountains.

The second half of mesocycle passed in plain conditions. Run volume in the aerobic mode decreased to 170 km. Run volume in the mixed and anaerobic modes increased considerably on this background. Much attention was paid to the improvement of technique of run and strengthening of the musculoskeletal system in combination with exercises in couples on extension of muscles and ligaments. The share of means of OPC decreased by 60% in comparison with the beginning of the preparatory period.

The stage of the main competitions lasting 4 months pursued the aim – to provide high functional and psychological preparedness of the sportsman for the competitive activity. The main assets of training: repeated and interval run, control starts and competitions. The stage was characterized by the gradual decrease in total amount of training loads and occurred against the background of increase in the high-speed modes of run. The share of means of OPC remained at the level of 60% of maximum.

The transition period assumed active recreation and recovery of sportsmen after the long competitive period. The loadings, serving to active restoration of physical efficiency and mental working capacity, were used to contrast in relation to competitive ones. In classes were used: long slow run, exercises with burdenings, swimming and diving with long breath holding, sports, different types of throwings of track and field athletics apparatuses.

Testing of the level of physical preparedness and functional condition of systems of organism of the sportsmen, who were

participated in the research, was regularly held in the course of preparation.

The increase in sports results of runners, the establishment by one of participants of the research of record of China in run on 800 m and the performance of standards of the world class master of sports by two sportsmen became the result of introduction of the program.

## Conclusions

1. The analysis of scientific and methodical literature showed that questions of the structure and the content of preparation of the qualified runners on middle distances are considered not rather deeply.

2. The application in preparation of the qualified runners on annual distances of trainings in the conditions of midlands and highlands influences preparedness of sportsmen positively.

3. The correct and the rational combination of means of preparation of runners on middle distances in mountain conditions and on the plain influences the level of r preparedness positively and promotes the professional development of sportsmen.

**Prospects of further researches:** the further researches are supposed to be devoted to studying of changes of physiological indicators at the runners on middle distances, who live in various climatic conditions under the influence of trainings in midlands and highlands.

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