**PHYSICAL EDUCATION AND SPORTS UNIVERSITY OF BUCHAREST**

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# RESEARCH ON THE EVALUATION AND DEVELOPMENT OF AEROBIC CAPACITY IN SENIOR FOOTBALLERS

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**Reasons for choosing the topic**

Domain experts, following the studies undergone at the latest major competitions (World and Continental Championships), concluded that the specific features of the modern game are: participating equally in both situations of the game (attack and defense), the trend of coverage of the entire field, frequent position and tasks changes as required. Therefore, players are required: **speed raised indexes** (all forms), **strength** (and **expansion**), **speed endurance**, extremely smooth and quick specific technique, sense of direction, decision-making capacity and a good tactical training.

In order to achieve the champion model in football, which meets all the requirements listed above, we must seek the most effective and fastest methods. One of these methods, and perhaps the most important in my opinion, is a demanding selection closely related to the preparedness stages. The previously described aspects led me to choose my topic of this thesis, which brings my modest contribution in the delicate process of highlighting the so complex potential under the influence of scientific training. Another reason for choosing this theme is to help improve the contents of the new line methods used in the physical training of footballers, but also to offer a means of information for those dealing in one way or another, with this in football. This need for improvement appears necessary because of an issue that should not be neglected at all: *the evolution of the football game*.

Through the proposed study, I believe that the present paper has a high degree of topicality in order to achieve the requirements of the modern football game, given the changes in the concepts and principles of training.

**The purpose of the paper**

Improving physical training to a second-league team of senior footballers using training methods that take into account the Maximum Aerobic Speed (MAS). The MAS is the reference point in choosing the intensity: sub-maximum (less than MAS), maximum (corresponding to the MAS) and supra-maximum (greater than MAS).

**Research objectives:**

- Comparative analysis of indicators of physical training tests in the experimental group compared to the control group.
- Establishing correlations between physical training on initial, intermediate and final testing in the experimental and control group.

- The contribution of scheduling workouts according to the Maximum Aerobic Speed on the physical training senior footballers.

**Research tasks:**

- establish hypotheses;
- consult bibliographic material;
- choice of instruments and team randomization;
- pilot tests;
- the experiment itself;
- collecting, processing and interpretation of data;
- drawing conclusions;
- drafting the present paper;
- public presentation of the paper;
- publishing of the research.

The **hypotheses** tested in the research-action performed on the experimental group are:

- The achievement of superior performance in the football game will occur, if the training meets the scientific criteria, including tests and the specific performance of preparedness standards.
- The directed preparation is a complex system that will operate with objective indicators (medical, biological, psycho-sociological, motor and methodic), in pursuit of a complex potential which under the influence of scientific training, will lead to high performance (and have a forecasting feature);
- The guidance models the in physical training of footballers will be operational tools that include somatic predispositions - functional - driving - psychic, determined by specific tests, from which an important one is to determine the Maximum Aerobic Speed.

**Research Methods and Techniques**

- bibliographic study method
- observation method
- measurement method
- statistical and mathematical methods

- graphical method
- experimental method

**The sample of subjects:**

The experimental group consists of the ***Danube Galati (second league)*** football team.

The control group consists of the Delta Tulcea football team.

The experimental group worked according to the programs developed, and the control group has conducted training according to the traditional methodology.

**The statistical processing** of the data collected from two research groups, the control and experimental groups, aimed to study the evolution of the following groups of parameters, in order to confirm or refute the research hypotheses:

- parameters for highlighting MAS and $VO_2$max;
- technical training parameters;
- physical training parameters;
- MGM test.

The testing and measurement of the parameters listed above were done before (initial test) and after (final testing) the application of different training programs for both groups of footballers. The purpose of the two tests was the confirmation or refutation of increasing the quality and effectiveness of programs and hence how these programs will have favorable or unfavorable repercussions on the performance behavior of athletes and obviously of the team.

**CONCLUSIONS TAKEN FROM THE EXPERIMENTAL PART OF THE PAPER**

By using the processing of the statistical data related to the parameters considered in this research, we can say:

1. Regarding the measurements of the MAS, there are significant differences between the two values obtained during the final two tests, in favor of the experimental group, the values of statistical indicators (the arithmetic average, the standard deviation, the range, etc) and the comparative graphs of the data of the final two tests support the theories stated above.
2. As for the $VO_2$ max, there are significant differences between the values obtained during the two final tests, in favor of the experimental group, for the majority of the parameters, except for long passes. The values of statistical indicators (the arithmetic

average, the standard deviation, the range, etc) and comparative data charts two final tests support the above claims. For this parameter, the null hypothesis was accepted after applying the ANOVA test;

3. In terms of technical training, there are significant differences between the two values obtained during the two final tests, in favor of the experimental group, the values of statistical indicators (the arithmetic average, the standard deviation, the range, etc) and the comparative data charts of the two final tests support the ideas stated above.
4. In terms of physical training, there are significant differences between the two values obtained during the two final tests, in favor of the experimental group, the values of statistical indicators (the arithmetic average, the standard deviation, the range, etc) and the comparative data charts of the two final tests support the ideas stated above.
5. As for the MGM test, there are significant differences between the values obtained during the two final tests, in favor of the experimental group, the values of statistical indicators (the arithmetic average, the standard deviation, the range, etc) and the comparative data charts of the two final tests support the ideas stated above.
6. This statement outlines the idea that the training of the experimental group was more effective, being focused on instructional objectives that were measured through the control samples used.

**FINAL CONCLUSIONS AND RECOMMENDATIONS**

1. The training program applied to the experimental group had improved the aerobic capacity in senior footballers, as reflected by the favorable performance of athletes during the final testing, and which have direct influence on the behavior of the athletes and of the performance team.
2. The results of the parameters of the research obtained during the final test by the experimental group confirmed the hypothesis on the sustainability of focusing the training of athletes on the guidance models in the physical training of footballers which must include operational tools that will include somatic - functional - driving – mental predispositions, determined by specific tests (Maximum Aerobic Speed) and aimed at developing aerobic capacity;
3. The comparative study of two groups of athletes through the parameters of the research, revealed statistically significant differences between the results of the two groups of athletes, always in favor of the experimental group. These results, based on statistics, entitle me to say that the training program made for training

athletes in the experimental group gave the expected results, and also support the confirmation of the hypothesis of the current research.

The training specific to the Maximum Aerobic Speed should be one of the important parts of the physical training program of the footballer.

- To pay great attention to individual and individualized training.
- The means used in practice to grow in terms of quality.
- In the process of training, the workload can be better delineated by means of training, which will influence the motor quality, or strength.

The relationships between the Maximum Aerobic Speed, $VO_2$ max and running performance allow finding the value of one of them, based on that of another. Finding the value of the MAS helps to easier determine the intensity of training intensity and to individualize it with greater precision.

Knowing the value of the MAS can help us to anticipate with high enough precision the performance that we can achieve while running, if you follow, of course, a proper training in order to develop the necessary strength required by the demanded performance, and if the running efficiency is not satisfactory.

If you know the MAS or $VO_2$max, depending on computed regressions we can find the performance that we can achieve on different distances during training.