



ISSN: 2456-4419

Impact Factor: (RJIF): 5.18

Yoga 2023; 8(2): 223-229

© 2023 Yoga

www.theyogicjournal.com

Received: 07-07-2023

Accepted: 10-08-2023

Dr. Saad Tayih Abid Fleih Al-Abise

Assistant Professor, General Directorate of Education in Babylon / Ministry of Education, Iraq

The effect of exercises according to the level of lactate concentration to developing speed reserve, lactate threshold and achieving the 800 m under 20 years

Dr. Saad Tayih Abid Fleih Al-Abise

DOI: <https://doi.org/10.22271/yogic.2023.v8.i2d.1460>

Abstract

The key to developing the speed reserve index and the lactate threshold, which is a high indicator of the efficiency of the work of organ functions, is to improve the efficiency of the work of muscle fibers during the large accumulation of lactate within the muscles as well as their capacity to generate the energy they require by removing and breaking down lactate during high training and bodily systems, which in turn has an impact on how athletes perform during competition. The goal of the research was to determine how different types of training affected young men's ability to create speed reserves, reach lactate thresholds, and run 800 meters. A single experimental group, a pre- and post-test, and an experimental design were employed by the researcher. For the 800 m race, 15 runners under the age of 20 from the governorates of the Middle Euphrates (Kerbala, Babel, Najaf, and Diwaniyah) and Baghdad made up the research population. For his study, the researcher selected a sample of 5 runners. In light of this, 33% of the research population was represented by the sample. The researcher's most significant finding was that the activities she provided in a systematic and scientific way for research sample participants helped the research variables.

Keywords: Lactate concentration, speed reserve, lactate threshold

1. Introduction

One sports competition that is marked by tension, excitement, and competitiveness amongst runners is the 800-meter running race. Performance in this sport hinges on the lactic anaerobic system's ability to produce energy. Because of the unusual event's enhanced lactate buildup in the muscle fibers during exercise and competition, the demand on the body's numerous functioning systems is quite high. Therefore, the player feels pain in the muscle and his speed slows down until he stops working completely when the accumulated amounts of lactic acid/lactate and hydrogen ions in the blood increase.

Developing the efficiency of the work of muscle fibers during the large accumulation of lactate within the muscles, as well as increasing the ability of these fibers to generate the energy they need by removing lactate and breaking it down during high training, is the main key to developing the speed reserve index, as well as the lactate threshold, which is a high indicator of the efficiency of the work of organ functions. And body systems, and this in turn is reflected in the development of athletic achievement during competition, as this requires workers and specialists in the field of training and exercise physiology, to prepare different exercises for which the level and quantity of lactate accumulation is the true standard, in order to develop the work of muscle fibers during high levels and large accumulation. For lactate, specifically under the most difficult conditions, i.e. (highly acidic conditions).

The most important exercises that provide this condition are exercises that are prepared according to the level of lactate concentration within the training unit according to intensity and volume, as they aim to raise the level with increased accumulation in order to improve the work of vital regulators and develop the speed reserve and lactate threshold, which is closely linked to increasing muscle tolerance to lactate accumulation, which is reflected in Turn on development achievement.

Corresponding Author:

Dr. Saad Tayih Abid Fleih Al-Abise

Assistant Professor, General Directorate of Education in Babylon / Ministry of Education, Iraq

1.2 Research Problem

The researcher observed that there is a discernible reduction in the level of success in the middle distances in general and the 800-meter running event in particular for the young category via his follow-up and field experience as a coach in this area for many years. Which prompted the researcher to investigate and learn the causes of the subpar performance. He attributes these causes to the fact that many of the exercises created by experts for training this activity lack precise specificity towards their goal and lack precise rationing based on the amount of lactate accumulation in the muscle fibers after the training. The exercises during the training unit depend on the type of exercises given to the runner, as the prevailing system for this event is the lactate system and its development requires exercises that work to change the levels and amount of lactate accumulation during the units of the weekly training cycle.

1.3 Research objective

1. Prepare exercises according to the level of lactate concentration.
2. Identify the effect of exercises according to the level of lactate concentration in developing speed reserve, lactate threshold, and achieving the 800 m under 20 years.

1.4 Research hypotheses

1. Exercises according to the level of lactate concentration have a positive effect on developing speed reserve, lactate threshold, and achieving the 800 m under 20

years.

1.5 Research fields

1.5.1 Human field: - Runners of the Middle Euphrates and the capital, Baghdad, for the 800 m event under 20 years of age.

1.5.2 Time field: - From 1/11/2022 to 1/5/2023.

1.5.3 Spatial field: - The stadiums of the Middle Euphrates and the capital, Baghdad.

2. Research Methodology and Field Procedures

2.1 Research Methodology

The researcher used an experimental design with one experimental group and a pre- and post-test.

2.2 The research community and its sample

For the 800m competition under 20 years old, the research community included 15 runners from the governorates of the Middle Euphrates (Kerbala, Babil, Najaf, and Diwaniyah), as well as the capital, Baghdad. The researcher randomly selected a sample of 5 runners for his study, and as a result, the sample included (33%) of the research community.

The researcher conducted a homogenization process on the members of the research sample according to the variables of height, mass, and chronological age. The researcher measured these variables and recorded them on the first day of the pre-tests, Table 1.

Table 1: Shows the homogeneity of the sample members

Variables	Measuring unit	Mean	Std. Deviation	Median	Skew ness	Coefficient Variation
Length	Cm	175.600	4.222	176.000	-0.284	2.404
Mass	Kg	61.600	5.103	60.000	0.941	8.284
Age	Year	270.000	34.525	264.000	0.521	12.787

It is clear from Table 1 that all values of the skewness coefficient were less than (+ 1) and the coefficient of variation was less than (30), which indicates the homogeneity of the sample.

2.3 Methods, devices and tools used in the research

- Note.
- Personal interview.
- Testing and measurement.
- An electronic device to measure height and weight.
- (2) Japanese cameras (SONY).
- Electronic calculator (ACER) number (1).
- A device to measure blood lactate (Lactate Scout), (2), German type.
- Measuring blocks (slices) of German origin.
- Medical Cotten.
- Sterile material.
- (2) Chinese type whistle.
- Stopwatch (4), Chinese type.
- Cones, 30 cm high, number (4).

2.4 Field research procedures

2.4.1 Determine the variables and tests to measure them

2.4.1.1 Determine the test for measuring speed reserve

After scanning sources, scientific books, and experimental research, in addition to the researcher’s field experience, a test was determined to measure the speed reserve variable through a maximum (200 m) test for each runner, and then fixing the time of each runner. After that, the speed reserve index is

extracted from the completion time, and the test will be explained later.

2.4.1.2 Determine the test to measure the lactate threshold

After scanning sources, scientific books, and experimental research, as well as the researcher’s field experience, a test (attempt time) was determined to measure the lactate threshold. This test is field-based and will be discussed in detail later.

2.4.2 Test description

800 m achieving test

The purpose of the test: To measure the speed reserve index and achievement of individuals in the research sample.

Test requirements: Legal playing field, stopwatches, video camera, signs, meter, three time clocks, three recorders, registration forms.

Description of the performance: After completing the warm-up requirements, the 800 m test begins for members of the research sample, where two athletes each begin the test. The test begins from a standing position, and after hearing the tester’s command to take your place, the two testers prepare to start. Then the tester blows the starting whistle, and the two testers set off to complete two laps of the field as hard as possible. The speed reserve index for the members of the research sample was extracted through the completion test. Before starting the completion test, the sample members are

tested for a distance of 200 meters at maximum speed (which will be detailed later). The stadium is divided into two parts (200 meters x 2), where high and clear signs are placed in front of the start line and in front of the middle. The beginning of the 200s, a mobile camera is placed in the middle of the field to film the entire test. A timekeeper stands at the starting line to time the total completion time and a timekeeper to time the second and fourth 200m, while the third timekeeper stands in the middle of the field to time the first and third 200 m. As for the scorers, their distribution will be the same as that of the timekeepers. In the same way, each two members of the research sample are tested separately. The testers stand on the starting line from a standing position, and upon hearing the absolute signal, the tester's start, with the first timekeeper timing the total time, and the third timekeeper, who stands in the middle of the field, timing the first 200 meters. The first, when the testers reach the middle of the field, the third timekeeper stops the time and records the times of the first and second testers (as the stopwatch can store more than one time). When the testers reach the middle, the second timekeeper starts timing the clock to time the time of the second 200 meters, and when the testers reach the start line, the timekeeper starts. The second is to stop the clock to record the time of the second 200 m, and at the same time the third timer starts timing the clock for the third 200 m, in the same way for the first session, and so on for all members of the research sample, data is collected and recorded, and after completion, the times are checked by photographic analysis to be more accurate and to ensure veracity. Times and judges. Upon completion of the test, the time is recorded on a special form.

Registration: The times of 4 x 200 m are recorded for each laboratory after completing the test and are placed in a special form prepared by the researcher. As for the method of measuring achievement, the completion time is recorded using a manual watch to the nearest hundredth of a second.

Second: Attempt time test

The purpose of the test: To measure the lactate threshold.

Test Requirements: Legal court, timer, shooter, whistle, stopwatch, recorder, GPS watches, pulse oximetry watches with chest strap, registration form.

Performance description: After completing the warm-up process and preparing the tools and preparing the heart rate monitor watches by attaching them to the chest strap, as well as ensuring that the process of linking the GPS watches to the moon signal is completed, 5 testers begin (each tester wears a GPS watch and a heart rate monitor watch with the chest strap). The test is from a standing position on the start line of the 400m, diagonally as at the start of the 800m. Upon hearing the absolute whistle, the testers start off with the timing of their watches. The testers must complete 30 minutes and maintain the running speed, which many specialists estimate to be between the speed of 10 km and the half marathon. After the testers complete the first 10 minutes, the timer blows a whistle and the testers press. The cycle button (split) to save the pulse rate for the first 10 minutes. After completing the remaining 20 minutes, the timer blows the stop whistle, then the testers press the stop button for two hours. In the same way, the members of the research sample complete the test.

Registration: Data is recorded using watches, where the distance traveled is calculated using GPS watches, in addition to calculating the number of cycles traveled to ensure the accuracy of the distance traveled. After transcribing the data into special forms, the average threshold speed in m/s is extracted by dividing the time by 30. Minutes in seconds, which amounts to 1800 seconds on the distance traveled for each laboratory, then multiplied by (60) in order to extract the distance traveled per minute, which represents the lactate threshold speed rate per minute. The heart rate is also recorded for the last 20 minutes of the hours of monitoring the heart rate, and the data is dumped in a form prepared by the researcher.

2.4.3 Measuring the maximum time to achieving 200 m

As we mentioned previously, extracting the speed reserve index depends on extracting the time for completing a distance less than the race distance and extracting the difference. A distance of 200 m was chosen, and to determine the time, the members of the research sample were tested at a distance of 200 m as much as possible, where 5 testers stand on the starting line 200 m from the middle of the field and each tested on his field (in the same way as the 200 m race). The testers start from a sitting position and after hearing the launcher's signal, they start as fast as possible. At the same time, the timekeepers (3) begin timing the hours, with the first timekeeper timing the times of first and third places, the second timekeeper timing second and fourth places, and the third timekeeper. Time for fifth place and transcribing the data using a special form prepared by the researcher. In the same way, the members of the research sample complete the test, and in the same way the test was repeated in the post-test.

2.4.4 Pre-tests

Before starting to implement the exercises prepared by the researcher, the researcher conducted pre-tests for the members of the research sample over two days and with an interval of one day, namely on Sunday and Tuesday, 18-20/12/2022, which is to measure the lactate threshold, the maximum 200m test, and the 800m test to measure achievement. Through this, the speed reserve indicator was measured. The test was conducted on the track of the Olympic Stadium in Holy Karbala. The researcher worked to establish all the conditions related to the tests, such as place, time, and method of implementing the test, as well as the assistant work team, in order to work to unify the same conditions when conducting the post-test. The distribution of the tests was as follows: -
Sunday 18/12/2022/, 9:00 AM / Try time test to measure lactate threshold
Tuesday 20/12/2022, 9:00 AM / 200m test.
4:00 PM / 800m test, measuring the speed reserve indicator, and measuring the lactate concentration level.

2.4.5 The main experiment

- Following the completion of the pre-tests, the researcher created lactate resistance workouts and incorporated them into the weekly schedule for 800 m runners in order to develop the research variables investigated for the experimental research group. To do this, the researcher relied on the analysis and review of a sizable number of specialized scientific sources and references. The researcher considered the physical capability and training level of the study sample participants as well as Through collaboration with the trainers and in order to control the experimental variable, the training of the sample

participants for the other days of the week took into consideration that the training's objective was the same for each participant in the study sample. The following characteristics of the training:

- Training modules were implemented in the special preparation stage.
- The workouts started on Sunday, December 25, 2022.
- The training program's workouts lasted for a total of 12 weeks.
- There were three training units in a week's worth of training, for a total of 36 training units in the exercises that were planned.
- The training units were held on Sunday, Tuesday, and Thursday.
- The high-intensity interval training and repetition training techniques were used by the researcher.
- Based on the outcomes of the pre-tests, the training intensity employed for each sample member varied between (80-115%) of the goal time.
- On Thursday, March 16, 2023, the exercises from the training program were finished being used.

2.4.6 Post-tests

After completing the exercises the researcher had created and included in the training program, the researcher repeated the tests that had been carried out in the experimental research group's pre-tests on Sunday and Tuesday (19,12/3/2023), as closely as possible using the same location, time, and procedures for the pre-tests of the research variables.

2.5 Statistical methods

- Mean.
- Std. Deviation.
- Median.
- Skew ness.
- Coefficient of Variation.
- T-Test for independent and symmetrical samples.

3. Presentation, analysis and discussion of the results

3.1 Presentation and analysis of the results of the pre- and post-tests for the variables of speed reserve, lactate concentration level, and achievement for the experimental group: For the experimental group's pre- and post-tests on the variables of speed reserve, lactate threshold, and achievement.

Table 2: Displays the mean, standard deviation, mean of differences, standard deviation of differences, calculated (t) value, and statistical significance

Variables	Test	Mean	Std. Deviation	Differences mean	Differences Std. Deviation	T Value Calculated	Sig level	Sig type
Speed reserve	pre	16.6000	.31623	2.42000	.14629	16.543	.000	Sig
	post	14.1800	.55408					
	post	173.4000	.89443					
Lactate threshold speed rate	pre	292.1400	1.70088	-4.56000	.55462	-8.222	.001	Sig
	post	296.7000	.83666					
Lactate threshold	pre	172.6000	1.14018	-8.0000	.73485	-1.089	.338	Sig
Achievement	pre	1.5760	.00894	.01400	.00245	5.715	.005	Sig
	post	1.5620	.00447					

The statistical indicators for the outcomes of the pre- and post-tests for the performance, speed reserve, and lactate threshold speed rate variables that the participants in the experimental group experienced are shown in Table 2. The levels of significance demonstrated by the findings that, if the results indicated that the mean values were better in the post-test and in accordance with the test levels of these variables, All of these variables fell below the threshold for significance (0.05), according to the statistical rule (T) for correlated samples, indicating that there were significant differences between the two tests and in favor of the post-tests.

The results also demonstrated that the pulse lactate threshold variable did not differ significantly between the pre- and post-tests. This was demonstrated by the significance levels through the application of the statistical law (T) for correlated samples, as this variable was greater than the significance level (0.05), which denotes the absence of significant differences. Among the two examinations.

4. Discussing the results of the pre- and post-tests for the variables of speed reserve, lactate concentration level, and achievement for the experimental group

First: Speed reserve: After presenting and analyzing the results of the pre- and post-test of the speed reserve variable represented in Table 2 for the members of the research sample for the experimental group, it was found that all members of the research sample were able to improve this variable as we mentioned previously.

The researcher indicates that the nature of the exercises that the members of the research sample applied throughout the

experiment period had a major role in developing the speed reserve variable as well as developing the other variables investigated, as these exercises were characterized by correct codification and careful planning of the training units during the preparation period.

This is what (Ahmed Youssef) pointed out: "Planning is considered one of the predictive procedures that depends on many studies of reality, taking into account experiences, the available capabilities and capabilities, and what can be achieved to achieve a specific goal, which is preparing athletes to reach the highest levels of achievement, and he agrees This is with (Jamal Sabry): "Correct training planning is to enable the athlete to reach the highest level of physical, motor, skill and psychological readiness to use during competition and to maintain this level for as long as possible through organized training.

When we want to develop or improve a variable, we must take into account the degree to which training and exercises are related to the nature and specificity of this variable, and to what extent they can affect it based on the opinions of specialists in the field in question, as well as relying on scientific sources.

Hence, the researcher confirms the importance of the exercises that he prepared for the three experimental research groups, as they played a major role in developing the speed reserve. The exercises relied on the level of lactate accumulation within the muscle fibers during the training units, and this in turn contributed greatly to developing the body's anaerobic metabolism potential as well as increasing the body's capacity. Muscles deal with the amount of lactate

produced, these exercises helped increase muscle carnosine, which led to an increase in the resistance of the body and muscles to work in strong acidic conditions, and this in turn was reflected in the development of the speed reserve variable, which resulted in the results of the post-test of the variable, where the arithmetic mean values decreased from the pre-test, since the variable was measured by time, therefore. Its value is the inverse, which indicates that the members of the research sample were able to run at a speed close to the test, which was represented by the distance of 200 metres.

The researcher confirms that the high training intensity that he adopted in regulating the exercises, as well as the duration of the stimulus time, and controlling the level and accumulation of lactate, had a major role in creating functional adaptations to the body's systems, which was reflected in increasing the ability to mobilize the largest possible number of fast fibers and increasing their resistance to fatigue, and thus developing Speed reserve, and this is what Buchheit confirmed. In order for a runner to develop his speed reserve file, functional adaptations must be created that help the body increase resistance to fatigue. Accordingly, they need to mobilize and adapt the rapid twitch muscle fibers, and this is also suitable mechanically, physiologically and psychologically to improve the achievement of the specialized activity, and for such adaptations to occur, the duration of the stimulus must be short periods performed repeatedly, for example ranging from 15 to 120 seconds with Recovery periods of 2-5 minutes and training intensity ranging from 90-120% of the target time, while maintaining the level of lactate accumulation.

Second: Lactate threshold: After presenting and analyzing the results of the pre- and post-test of the lactate threshold variable (pulse), represented in tables (2) for the individuals in the research sample for the experimental group, it was found that there was no change in the pulse between the two tests, as the results resulted in no significant differences between the two tests, and the researcher indicates that the reason for the lack of change in the pulse between the pre- and post-tests for individuals in the research sample is that the 30-minute Time Trial30 used to measure the lactate threshold, as we mentioned previously. The effort during the test is not constant, and this test depends on two test: the pulse and the lactate threshold speed, which we defined as distance/minute. Since the development has occurred in the lactate threshold speed, the researcher confirms that the members of the research sample were able to cover a greater distance at a speed higher than. The pre-test was at the same pulse rate, and this indicates the development in physical and functional ability that occurred among the members of the research sample.

This is what (Joe Friel) pointed out that the good information that workers and specialists in the sports field can record from the (-minute Time Trial30) test is the lactate threshold speed distance/minute, as well as the heart rate at the lactate threshold (LT), but the heart rate The lactate threshold does not change much in subsequent tests, although the athlete's physical ability improves, what will change is speed for the better.

As for the variable rate of lactate threshold speed, it was shown from the above-mentioned table that there are significant differences between the pre- and post-test, in favor of the post-test, and for all members of the experimental research group, which indicates a development in the lactate threshold, as the members of the research sample were able to

improve the distance traveled in the 30-hour test. Minutes this indicates the development of speed at the lactate threshold, the researcher points out that the factors that led to the development of speed at the lactate threshold are many and intertwined with each other. The nature of the exercises in terms of intensity and density, for which the high level and large accumulation of lactate was the real test, as we have repeatedly pointed out in this matter, as these exercises helped to develop the maximum level of oxygen consumption. (VO₂ max) because the intensity of the exercises was very high, reaching 130% of (VO₂ max), this is considered a very important factor for developing the lactate threshold. This is what was confirmed by (Jones, Carter) in their study that the intensity and intensity of training has a great benefit as training speed is important for developing VO₂max and athletic performance, as well as increasing the percentage of oxygen consumption with the subsequent possibility of raising the level of the athlete's speed at the lactate threshold. On the other hand, the researcher attributes the development of speed at the lactate threshold to improving the metabolism and energy production process. Exposing the body to exercises of a lactic nature forces the body's systems to oxidize carbohydrates to produce energy because the work requirements are very high, and this in turn produces pyruvate after a series of 11 reactions to produce energy. Accordingly, increasing the body's ability to break down pyruvate during the Krebs cycle without making it vulnerable to the union of two hydrogen atoms to form lactic acid increases the possibility of working for a long time and at a high speed without the accumulation of lactic/lactate within the muscle fibers and blood, in addition to improving the work of monocarboxylate transporters (MCTs), as indicated. Many studies have shown, and this in turn reflects an increase in speed that lasts for a long time without decreasing the level of performance.

This was confirmed by (Evertsen, *et al.*) in their study that the improvement in the speed of the lactate threshold is achieved by enhancing the metabolic ability to produce energy during training and competition through the oxidation of pyruvate, as well as the ability to transfer lactate from the muscles to the blood, as the transfer of lactate from the muscles depends on each... of diffusion across the cell membrane, and most importantly, the concentration of monocarboxylate transporters (MCTs). MCTs are responsible for transporting lactate into and out of working muscles. It has been proven that the concentration of MCTs is developed after high-intensity training, and thus the ability to remove lactate from working muscles is enhanced. In well-trained athletes, the study also indicated that high-intensity and intensity exercises lead to improvements in the lactate threshold and athletic performance by increasing the body's ability to deal with lactate accumulation, and that these improvements in the speed of the lactate threshold cannot be related to improving the ability to produce lactate, as The researchers suggested that a lower rate of lactate production is a possible mechanism for improving lactate threshold speed.

Through what was discussed above, it becomes clear the role of the exercises prepared by the researcher in developing the rate of lactate threshold speed among members of the research sample, as the high intensity that characterized the exercises, as well as the training method in which the exercises were applied, which is high-intensity interval and repetitive training, had a significant impact on developing ability. The body is physically and physiologically, thus improving this variable, and this is what was confirmed by (Gamal Sabry

Faraj) that high-intensity training, which includes training above the lactate threshold, and qualitatively includes efforts with an intensity of 95-100% of the ((VO₂ max) with a recovery period of 90-120 seconds, as it can lead This training leads to an increase in speed or power output less than the VO₂max, which leads to an improvement in speed/power output at the lactate threshold.

Third: Achievement: After presenting and analyzing the results of the pre- and post-test of the achievement variable represented in Tables (2) for the individuals in the research sample, it became clear that all members of the research sample were able to improve this variable, and the results of the two tests resulted in the emergence of significant differences between them and in favor of the post-test.

One of the most difficult tasks facing those working in the field of training and exercise physiology is interpreting the real relationship between the components of the external and internal training load, which requires scientific knowledge of the nature of the requirements and the specificity of the specialized event, as achieving the sporting achievement of a sporting event requires understanding its physiological requirements and determining the physical characteristics of the athletes from In order to develop exercises that suit the nature of the requirements of this event and to ensure the development and improvement of the physiological and physical variables that are closely linked to the development of achievement, from the above, the researcher confirms the importance of the exercises that the members of the research sample applied, as they are closely related to the specificity of the activity, as the exercises relied on developing the body's ability to produce and accept lactic acid, which is considered the basic system in producing energy for this activity. These exercises contributed to increasing the body's ability to work in strong acidic conditions. As we said, the goal of the exercises after each training unit was the large accumulation of lactate within the muscle fibers and the blood. The researcher used lactate test continuously from one week to another to confirm the effectiveness of the exercises and the extent to which the research sample members responded to them. These exercises contributed significantly to improving achievement, and we noticed this by increasing the concentration of lactate level in the post-test after the achievement test, and this indicates an increase in the ability of muscle fibers to work with the large accumulation of lactate without a significant decrease in the level of performance, as well as improving the speed endurance of the individuals in the research sample, and this By improving the speed reserve indicator, improving these variables had a decisive role in improving achievement, since the latter represents the final outcome of sports training. On the other hand, the researcher shows that the correct understanding of the relationship between external load and internal load, since the latter represents the body's reactions to exercise, is considered one of the scientific basics for achieving athletic achievement, and this is what the researcher adopted it when developing the exercises by regulating the intensity and duration of the stimulus, as well as the recovery time between repetitions, based on their goal during the training unit and in a way that suits the capabilities of the athletes and the requirements of physical and physiological effectiveness.

Whyte Gregory has indicated that athletes who compete in events lasting between (20 seconds and 4 minutes) will seek to increase their ability to withstand high levels of lactic acid accumulation to improve their performance, as this can be

achieved by repeating exercises whose duration ranges from 10-120 seconds, as the pH will drop and very high levels of lactate will be produced in the blood (eg 12 mmol/L). For this reason, this type of anaerobic endurance training is often referred to as "lactic capacity" training. Athletes who the race distance places high demands on anaerobic energy production and the ability to produce such energy. This type of training provides effective goals for achieving achievement, as it helps develop the ability of the vital regulators in the body and increase their capacity, as well as developing the ability of the muscle fibers to work at a high level of lactate. This training places very high demands on the body, and on the capabilities of the vital regulators inside and outside the muscles. The recovery periods between repetitions must allow for the restoration of cellular balance, including the return of the pH towards resting levels and the removal and oxidation of lactate. The ratio of work: rest period in the region of (1:4) must be used for such training (and this is what the exercise researcher relied on).

5. Conclusions and Recommendations

5.1 Conclusions

1. The exercises prepared by the researcher for members of the research sample in a scientific and codified manner contributed positively to the development of the research variables.
2. Exercise contributed to the development of the speed reserve index and the lactate threshold, which in turn was reflected in improved performance.

5.2 Recommendations

1. The researcher recommends adopting the exercises used in the study as components of training programs for specialists in the 800m running event, as they contributed to the development of physiological and physical variables.
2. The necessity of relying on the relationship between the components of the external and internal load when setting the components of the training load (intensity, volume, density, rest).

6. References

1. Ismail, Muhammad Reda Ibrahim. Field application of theories and methods of sports training, 3rd edition, Baghdad, Al-Fadhli Office; c2008.
2. Al-Qat, Muhammad Ali. Physiology and Training, Cairo, Dar Al-Fikr Al-Arabi; c1999.
3. Miteb, Ahmed Youssef. Sports Training Skills, 1st edition, Amman, Safaa Publishing and Distribution House; c2014.
4. Faraj, Jamal Sabri. Strength, Ability and Modern Sports Training, Amman, Dar Degla; c2012.
5. Faraj, Jamal Sabri. Speed endurance and speed endurance: Concept and physiology, 1st edition, Al-Wefaq Publishing House, Amman; c2022.
6. Buchheit M, Laursen PB. High-intensity interval training solutions to the programming puzzle: Part II: Anaerobic energy neuromuscular load and practical applications, Sport Med; c2013.
7. Evertsen F, *et al.* Effect of training intensity on muscle lactate transporters and lactate threshold of cross-country skiers, Act Physiological, Scandinavia; c2001.
8. Friel J. Total heart rate training customize and maximize your workout using a heart rate monitor, Library of Congress, Canada; c2006.

Appendix**Shows examples of training units with exercises according to lactate concentration**

Training unit number: (1)

Day and date: Sunday 25/12/2022

Total training time: 34.19 minutes

Total training volume: 4000 m

N	Exercise/m	Intensity	Exercise time	Repetition	Rest between		Total time minute
					Repetition minute	Groups minute	
1	1000	85%	2.47 minute	1	-	4	6.47
2	600	95%	1.30 minute	3	3	5	15.30
3	200	105	27	6	2	-	12.42
Total	4000			10			34.19
Target time: 1.54							

Training unit number: (5)

Day and date: Tuesday 5/1/2023

Total training time: 33.07minutes

Total training volume: 4200 m

N	Exercise/m	Intensity	Exercise time	Repetition	Rest between		Total time minute
					Repetition minute	Groups minute	
1	800	85%	2.11 minute	1	-	4	6.11
2	600	95%	1.30 minute	3	3	5	15.30
3	400	95%	59	4	2.30	-	11.26
Total	4200			8			33.07
Target time: 1.52							

Training unit number: (12)

Day and date: Thursday 19/1/2023

Total training time: 42.09minutes

Total training volume: 3500 m

N	Exercise/m	Intensity	Exercise time	Repetition	Rest between		Total time minute
					Repetition minute	Groups minute	
1	600	85%	1.42	1	-	5	6.42
2	400	90%	64.4	3	3	5	14.13.2
2	300	95%	46	3	3	5	13.18
3	200	100	29	4	2	-	7.56
Total	3500			10			42.09
Target time: 1.56							

Training unit number: (20)

Day and date: Tuesday 7/2/2023

Total training time: 38.36 minutes

Total training volume: 4600 m

N	Exercise/m	Intensity	Exercise time	Repetition	Rest between		Total time minute
					Repetition minute	Groups minute	
1	800	85%	2.11 minute	1	-	4	6.11
2	600	95%	1.30 minute	3	3	5	15.30
3	400	95%	59	5	3	-	16.55
Total	4600			8			38.36
Target time: 1.52							