SEA - Practical Application of Science
Volume VII, Issue 19 (1 / 2019)

Corina TIFREA,
Ben Salah HAYTHEM
National University of Physical Education and Sports of Bucharest

MONITORING THE PREPARATION WITH THE HELP OF BIOCHEMISTRY TESTS IN THE TRAINING PERFORMANCE FOOTBALLERS

Case Study

Keywords
Training;
Performance;
Fotballers;
Biochemistry

Abstract

The effort in the football game presents energetic characteristics, which must be taken as a starting point in the planning of the training effort. Of course, there is controversy regarding the level of participation of one system or another in supporting the effort, but one fact is certain, all three energy supply systems contribute to supporting the specific effort. Muscles contain 80% water and 20% solids, organic and inorganic. Organic substances. The most important are the proteins and energetic substances that are divided into myofibers and sarcoplasm. Myofibril proteins are contractile proteins (actin, myosin), others have a regulatory role. The energetic substances of the muscle are carbohydrates, lipids and macroergic substances.

The effort in the football game presents energetic characteristics, which must be taken as a starting point in the planning of the training effort. Of course, there is controversy regarding the level of participation of one system or another in supporting the effort, but one fact is certain, all three energy supply systems contribute to supporting the specific effort (Ciolca, 2015).
Intensity zone 1: anaerobic-alactacid zone or ATP - CP area. The goal of training in this area is the development of power (speed - force), or faster than the opponent. The ability to accelerate, decelerate, change the direction of movement, jumps, sudden turns, hitting the ball, fighting with the opponent are expressions of the combined quality speed - strength, and essential elements of the football game. The energy sources of this area are ATP - CP. The lactate concentration is close to the lactate concentration. Training in this area seems relatively straightforward if the dosage is adhered to. The intensity of the exercise is 95 - 100%.
Intensity zone 2: tolerance to lactic acid. The objective of this area is the adaptation to the effects of lactic acid. It is an area with high concentrations of milk from 12 to 20 mmol, the objective being to increase the athlete's ability to tolerate lactic acid. Players who can tolerate acidosis better can perform better and for a longer period of time, producing more energy at the anaerobic level, very important at the end of a trial or at certain moments of the effort, when the situation requires sustained efforts lasting 30 - 90 seconds."The ability to remove lactic acid from the bloodstream and use it as energy (Bonen & col, 1997), is an adaptive response that delays fatigue. Recent studies, Bonnen, 2001, have shown that lactic acid carriers increase in number. " The optimal repetition time is 30 - 60 seconds, but efforts can be carried out around 2 - 3 minutes, provided that a lactate concentration of 12 - 16 mmol is ensured.
Intensity zone 3: - VO2 max, or maximal aerobic power training (PAM), with a lactate concentration of 6 - 12 mmol, results in improved oxygen transport and utilization. The high intensity and high lactate concentration do not allow long training efforts or a large number of repetitions. For this reason, the training volume often does not produce the maximum adaptations of aerobic metabolism. Due to the high concentration of blood lactate, it is not advisable to train this effort area with that of lactation tolerance, in the same training session. I personally recommend training this area in the training lesson using the method of intermittent efforts, with an effort/break ratio of 2/1 or 1/1, grouped in 2 - 3 series of 10 - 12 minutes each.
Intensity zone 4: the anaerobic threshold area, is the most beneficial for the development of the aerobic capacity of effort. The lack of training at the anaerobic threshold is represented by the difficulty of finding this threshold, or more precisely, that intensity of the effort in which the production and consume of lactic acid are in balance. Some authors consider the concentration of 4 mmol corresponding to the anaerobic threshold, others also rightly prefer the term individual anaerobic threshold (PANI) with values between 3 - 6 mmol (Dragnea, 1978).
Intensity zone 5: the aerobic threshold area, aims to increase the aerobic capacity, by using a large volume of effort. It is an area attacked especially during the preparatory period, from rehabilitation to effort, specific to long and low intensity efforts.
Intensity zone 6: aerobic compensation, aims to recover after exercise. This type of effort is applied at the end of the training lesson (10 - 15 minutes), after a high-intensity training cycle or whenever necessary to avoid fatigue and to ensure overcompensation. In the competitive period this training is used after the competition, immediately or the next day.

Biochemical composition of muscle

Muscles contain 80% water and 20% solids, organic and inorganic. Organic substances. The most important are the proteins and energetic substances that are divided into myofibers and sarcoplasm. Myofibril proteins are contractile proteins (actin, myosin), others have a regulatory role. The energetic substances of the muscle are carbohydrates, lipids and macroergic substances (Apostu, 2013). By glycogenolysis, glucose molecules are released which are abolished on the spot, providing the energy needed to restore the macroergic molecules. Macroergic molecules are adenosine triphosphate (ATP) and creatine phosphate (CP). ATP directly develops the energy required for contraction, and CP ensures the recovery of ATI molecules. Inorganic substances. They are, as with other cells, mineral salts: chlorides, sulphates, sodium phosphates, potassium, calcium, magnesium (Stanculescu, 1981).

CONCLUSIONS

· The applied microcycles reached their purpose, the results obtained by showing relatively homogeneous values with an average heart rate of 65.15 beats / minute before exercise , an average value of lactic acid of 1.9mmol / kg, so at the end of the training sessions the recovery after efforts in mixed regime at 1-3-5 minutes to have an average value of 147/118/112 beats / minute and an average of lactic acid of 11.36 mmol / kg.
· The investigation of the cardiac frequency realized after the tests surprised the modality of diversified request of each player according to his area of play, the values VO2max having an average of 61.71ml / kg / min, VAM 17, 63km / h, and FC having a max of 174 beats / minute and a minimum

of 134 beats / minute after the first minute of recovery / effort (Table 1).
.

REFERENCES

[1] Apostu M. (2013). *Biochime, editura Printech*, Bucureşti
[2] Ciolca SM (2015). *Fotbal, curs de specializare.* Editura cartea universitara Bucuresti
[3] Dragnea, A (1978). *Antrenament sportiv, teorie si metodologie*, vol. 2, Editura ANEFS , Bucuresti
[4] Stanculescu V. (1981). *Ghidul antrenorului de fotbal*, Editura Sport-Turism, Bucureşti.

Table 1
VAM, VO2 / MAX, LACTIC ACID values before and after effort

Name and surname	**Values before effort**	**Maximum aerobic speed**			
	Lactic acid (mmol/kg)	**VAM (Km.h-1)**	**VO2max (ml/kg/min)**	**FC (bpm)**	**Lactic acid (mmol/kg)**
B. Y. R.	2,8	19,00	66,50	192	12,4
C. M.	2,3	15,50	54,25	192	8,7
B. R. S.	2,6	19,00	66,50	209	13,4
B. H.L.	2,3	17,25	60,38	198	14,7
Z. K.	1,7	19,10	66,85	193	9,0
M. M.	2,4	19,00	66,50	181	16,4
B. Y. A.	2,1	17,40	60,90	186	10,3
T. W.	0,8	18,00	63,00	205	10,0
K. S.	2,1	16,25	56,88	194	8,1
Z. A.	1,0	18,25	63,88	203	12,8
L. A.	1,9	17,00	59,50	192	8,0
B. O. R.	1,4	17,00	59,50	182	7,6
N. A.	2,4	19,00	66,50	207	15,4
R. R.	1,2	15,00	52,50	192	5,2
B. W.	1,4	17,00	59,50	192	12,9
B. Z.	2,1	18,25	63,88	201	11,9
M.S.	2,1	18,00	63,00	193	12,8
M. A.	1,7	19,25	67,38	193	12,4
H. Y.S.	1,8	17,62	61,67	193	14,6
S.L.	1,9	15,75	55,13	194	10,6
Average	***1,9***	***17,63***	***61,71***	***194,6***	***11,36***