STATISTICAL ASPECTS OF THE EFFECTS ACHIEVED BY A RICH NOURISHMENT IN IRON OVER THE DRIVING QUALITY - SPEED

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Abstract
If the footballers have anaemia, they are incompetitively and incapable to do a easy training. The footballers predisposed to anaemia will must to consume a certain quantity of meat in them diet or to choose rich nutriments in iron „M". For the footballers, the aerobycal component is very important and from this motive, a doubt disadvantage appears: the high level of the footballer it's joined either of the contribution of oxygen, or of them capacity for to use a big quantity of oxygen in each minute.
Key words: *anaemia; oxygen; muscles; iron; diet; training; football.*

INTRODUCTION

In usual mode, a footballer inserts together with the nutriments same milligrams of iron on day. Only a little part (under 10 %) is absorbed, but in case when they lose the iron more then they absorb this component, we can speak about a shortcoming of iron who can produces negative effects over the capacity of transport of the oxygen by the blood. Also, this shortcoming of iron can have negative effects over the capacity of the muscles for to use the oxygen.

The factors who influence the absence of the iron, are: an insufficient contribution of iron on the base of nutriments; a reduced absorbtion at intestinal level; a growth in to lose the iron. We must to have in view that there are footballers which have the total quantity of iron contained by the body at minimal levels, without as through this to manifest a symptom.

It's a unstable state of equilibrum between entrances and exits (between to absorb and to lose the iron) and it's easy to spoil this equilibrium. Consenquently it's important to discover the forms of anaemia in the latent and prelatent phase.

We must to offer attention for the values concerning haemoglobyna, and for the haematical level concerning feritynа (who it's a indexe of the quantity for iron presents in weavels). If the feritynа lowers, we must to grow the contribution of iron. In this way, the iron is introduced in body either through nutriments, or medicines. Also, if we aplly mediterranean diet, generally the contribution of iron is 10 miligrams on day.

The rich foods in iron there are: the meat, the salamies, the fishes, the yolk of egg, the greens, the chocolate, some verdures (the red radishes, the spinach, the parsley) the integral cereals and the dry fruits. In this meaning, in a hundred of grams from nutriments mentioned in continuation, we find the next quatities of iron [6]:

- spleen 26 mg; kidney 12-15 mg; liver 7-8,5 mg; heart 5 mg; the fine meat of horse until at 7 mg; the meat of cattle, pork, chicken, hare 2-3 mg; salami 2,4 mg;
- fishes 1,5-2,5 mg;
- yolk of egg 6,3 mg;
- yeast 28 mg;
- almonds 4 mg, dry fig 3,6 mg; spinach and parsley 3-4 mg.

We must to know that it's absorbed a little part from the iron who is from the nutriments.

The iron M from the hemoglobyna and the mioglobyna, who there is in the meat and the fish, only in a favourable situations it's absorbed 30 %, while the iron „non–M" with the vegetable origin it's absorbed 10 %. Also, we must to specify that in nutriments the iron is under the shape M (respectively the hemoglobyna and mioglobyna) and non-M, in exchange it's hard of absorbed.

The researches show that many footballers consume nutriments with poor content of iron, especially with little iron M (little meat), in time what them diet is rich in milk and products on the base of milk, in rich nutriments in hydrats of carbon.

The footballers predisposed to anaemia will must to consume a certain quantity of meat in them diet or to choose rich nutriments in iron M, respectively products on the base of fish and white meat who is more little detrimental to health face to the meat of cattle, pork and mutton. Yet, at all the individuals the divers combinations of nutriments can to favour or inhibit the absorbtion of the iron.

Because the footballers have daily training, we observe that they lose the iron more much than a sedentary person. Thus, at footballers grows the quantity of iron losed:

- in the same time with perspiration. The perspiration contents 0,18 milligrams of iron at one litre in the case of the mans, while in the case of womens, the perspiration is in a considerable quantity, especially for the sportives who have daily training in conditions of raised temperatures, humidity of the air or solar radiation.
- through urine. Face to the healthy and normal individuals who don't make training, in the urine of the footballers there are the hemoglobyna, mioglobyna and the red cells.

In the case of prelatent and latent anaemie, the negative balance sheet of iron express the recording with view at the diminuation of the stocks for iron. So, if the analysis of blood express a absence of iron, the first thing who we can to do it's the growth of the contribution for the iron on the way of nourishment.

Already, we know that the iron M is more easy to absorbed than the iron non-M. So, it's good to consume meat or liver, than greens or spinach.

We must know that somes substances from nutriments (the proteins from milk and eggs) favour the appearance of the components for the iron who are insolubles and they cannot be absorbed.

The acidity fron stomach, as well as in nutriments of the substances antioxydants (especially the vitamin C) tend to hamper the formation of these insolubles components and in the same time to facilitate as the iron with the state of ferycal yon (with three positive charges) to pass by in the state of feros yon (with two positive charges) [6].

Somes researches show if we take in the morning on the emptiness stomach a juice of wrung out citrices who contain the vitamin C or more good juice of oranges or lemon and the vitamin C, we avoid the states with absences of the iron.

AIM

The aim of this research consists in to reflect the effects concerning a rich nourishment in iron M over the values of the speed for the footballers from F.C. Otelul Galati team.

HYPOTHESIS

This research has the next hypothesis: we suppose that a rich nourisment in iron M cans to improve the values of the driving qualiy named speed, for the footballers of F.C. Otelul Galati team.

MATERIAL AND METHODS

We achived this research in the period 2012-2013, at F.C. Otelul Galati and we observed 16 footballers of (13-14) years. In the aim of the achievement concerning this paper, we used the next research methods: the scientifical documentation, the statistical method and the observation method.

Table 1. The players from F.C. Otelul Galati team

No.	Name and firstname	The birthday
1	BORDIEANU STEFAN	2.06.1999
2	MOROIANU ALEX.	5.08.1999
3	SURCICA DORIN	9.12.1999
4	CIOBANU ANDREI	27.05.1999
5	NENITA ALEXANDRU	18.04.1999
6	BUZATU SANDEL	22.05.1999
7	HOHA ADRIAN	15.06.1999
8	CRISTEA MARIAN	07.02.1999
9	POPA ADRIAN	01.07.1999
10	CODREANU ADRIAN	22.11.1999
11	CRISTEA ROBERT	11.06.1999
12	SIRGHI VALENTIN	26.04.1999
13	MAFTEI IONEL	11.04.1999
14	TOMA FLORIN	02.10.1999
15	ISTRATE ALEXANDRU	14.06.1999
16	IORDAN ERIC	26.07.1999

RESULTS OF THE RESEARCH

TESTS OF THE DRIVING QUALITY

Table 2. Initial tests for F.C. Otelul Galati team

No.	Name and firstname	30 m Speed (seconds)	4 x 10 m Speed (seconds)	2000 m Endurance (minutes and seconds)
1.	B.S.	5''28	12"78	12'19''
2.	M.A.	4''92	11''48	14'35''
3.	S.D.	4''80	11''13	13'11''
4.	C.A.	5''01	11"34	13''61'
5.	N.A.	5''08	11''88	13'75''
6.	B.S.	4''98	11''50	13'43''
7.	H.A.	5''44	11"94	12'07''
8.	C.M.	4''79	11''12	14'03''
9.	P.A.	5''46	12''52	13'43''
10.	C.A.	4''70	11"63	13'58''
11.	C.R.	4''99	11''43	13'23''
12	S.V.	4''95	11''96	12'05''
13	M.I.	4''60	11"17	14'50''
14	T.F.	5''00	11''36	14'50''
15	I.A.	4''93	11''69	12'50''
16	I.E.	5''28	11"85	13'50''

Table 3. Final tests for F.C. Otelul Galati team

No.	Name and firstname	30 m Speed (seconds)	4 x 10 m Speed (seconds)	2000 m Endurance (minutes and seconds)
1.	B.S.	5.22	11.02	11.00
2.	M.A.	4.85	11.36	9.19
3.	S.D.	4.73	10.86	10.24
4.	C.A.	4.54	10.67	10.08
5.	N.A.	4.92	10.58	9.31
6.	B.S.	4.64	10.80	9.10
7.	H.A.	4.82	10.60	9.35
8.	C.M.	5.32	10.80	9.07
9.	P.A.	4.73	10.67	9.10
10.	C.A.	4.67	10.36	8.38
11.	C.R.	4.57	10.07	8.58
12	S.V.	5.10	11.16	11.00
13	M.I.	5.02	10.10	8.16
14	T.F.	4.42	9.92	8.45
15	I.A.	4.95	10.67	8.47
16	I.E.	5.10	10.86	8.31

Through the help of the test T and test F, we want to know if there is a significant diference between the initial test and final test as following to administration of the iron M.

We start from the test F:

$$F = \frac{s_1^2}{s_0^2} = \frac{\dfrac{\sum_{i=1}^{n}(x_{1i} - \bar{x}_1)^2}{n_1 - 1}}{\dfrac{\sum_{i=1}^{n}(x_{0i} - \bar{x}_0)^2}{n_0 - 1}}$$

Table 4. The calculation of the poll dispersion for the initial and final test Speed 30 m

No.	Name and firstname	Speed 30 m Initial (seconds) (x_{0i})	Speed 30 m Final (seconds) (x_{1i})	$(x_{0i} - \bar{x}_0)^2$	$(x_{1i} - \bar{x}_1)^2$
1.	B.S.	5''28	5.22	0,0729	0.1369
2.	M.A.	4''92	4.85	0.0081	0.0000
3.	S.D.	4''80	4.73	0.0441	0.0144
4.	C.A.	5''01	4.54	0.0000	0.0961
5.	N.A.	5''08	4.92	0.0049	0.0049
6.	B.S.	4''98	4.64	0.0009	0.0441
7.	H.A.	5''44	4.82	0.1849	0.0009
8.	C.M.	4''79	5.32	0.0484	0.2209
9.	P.A.	5''46	4.73	0.2025	0.0144
10.	C.A.	4''70	4.67	0.0961	0.0324
11.	C.R.	4''99	4.57	0.0004	0.0784
12	S.V.	4''95	5.10	0.0036	0.0625
13	M.I.	4''60	5.02	0.1681	0.0289
14	T.F.	5''00	4.42	0.0001	0.1849
15	I.A.	4''93	4.95	0.0064	0.0100
16	I.E.	5''28	5.10	0.0729	0.0625
Total		80.21	77.60	0.9143	0.9922

$$\bar{x}_0 = \frac{\sum_{i=1}^{n} x_{0i}}{n_0} = \frac{80{,}21}{16} = 5{,}01 \text{ seconds and } \bar{x}_1 = \frac{\sum_{i=1}^{n} x_{1i}}{n_1} = \frac{77{,}6}{16} = 4{,}85 \text{ seconds}$$

$$s_0^2 = \frac{\sum_{i=1}^{n}(x_{0i} - \bar{x}_0)^2}{n-1} = \frac{0{,}9143}{15} = 0{,}060953333 \; ; \quad s_1^2 = \frac{\sum_{i=1}^{n}(x_{1i} - \bar{x}_1)^2}{n-1} = \frac{0{,}9922}{15} = 0{,}066146666$$

$$F = \frac{s_1^2}{s_0^2} = \frac{0,066146666}{0,060953333} = 0,92$$

For $\alpha = 0,1$ we observe through the table Fisher that $F_{tab} = F_{f_1, f_2, \alpha} = 1,9722$. where $f_1 = n-1$ and $f_2 = n-1$

So. $F_{calc} = 0,92 < F_{tab} = 1,9722$

Thus. $$t_{calc} = \frac{\overline{x_1} - \overline{x_0}}{\sqrt{(n_0 - 1) \cdot s_0^2 + (n_1 - 1) \cdot s_1^2}} \cdot \sqrt{\frac{n_0 \cdot n_1 \cdot (n_0 + n_1 - 2)}{n_0 + n_1}} =$$

$$= \frac{4,85 - 5,01}{\sqrt{(16-1) \cdot 0,06 + (16-1) \cdot 0,07}} \cdot \sqrt{\frac{16 \cdot 16 \cdot (16+16-2)}{16+16}} = -1,78$$

So, $|t_{calc}| = |-1,78| = +1,78 > t_{tab} = t_{30;0,1} = 1,697$ for $\alpha \geq 0,1$. Consequently, there is a significant diference between the initial test Speed 30 m and the final test Speed 30 m, as following of the consumption concerning the iron M.

Table 5. The calculation of the poll dispersion for the initial and final test Speed 4 x 10 m

No.	Name and firstname	Speed 4 x 10 m Initial (seconds) (y_{0i})	Speed 4 x 10 m Final (seconds) (y_{1i})	$(y_{0i} - \bar{y}_0)^2$	$(y_{1i} - \bar{y}_1)^2$
1.	B.S.	12"78	12"78	1.2321	0.1296
2.	M.A.	11''48	11''48	0.0361	0.4900
3.	S.D.	11''13	11''13	0.2916	0.0400
4.	C.A.	11"34	11"34	0.1089	0.0001
5.	N.A.	11''88	11''88	0.0441	0.0064
6.	B.S.	11''50	11''50	0.0289	0.0196
7.	H.A.	11"94	11"94	0.0729	0.0036
8.	C.M.	11''12	11''12	0.3025	0.0196
9.	P.A.	12''52	12''52	0.7225	0.0001
10.	C.A.	11"63	11"63	0.0016	0.0900
11.	C.R.	11''43	11''43	0.0576	0.3481
12	S.V.	11''96	11''96	0.0841	0.2500
13	M.I.	11"17	11"17	0.2500	0.3136
14	T.F.	11''36	11''36	0.0961	0.5476
15	I.A.	11''69	11''69	0.0004	0.0001
16	I.E.	11"85	11"85	0.0324	0.0400
Total		186.78	170.5	3.3618	2.2984

In analogous mode:

$$F = \frac{s_1^2}{s_0^2} = \frac{\dfrac{\sum_{i=1}^{n} (y_{1i} - \bar{y}_1)^2}{n_1 - 1}}{\dfrac{\sum_{i=1}^{n} (y_{0i} - \bar{y}_0)^2}{n_0 - 1}}$$

where:

$$\bar{y}_0 = \frac{\sum_{i=1}^{n} y_{0i}}{n_0} = \frac{186,78}{16} = 11,67 \text{ seconds and } \bar{y}_1 = \frac{\sum_{i=1}^{n} y_{1i}}{n_1} = \frac{170,5}{16} = 10,66 \text{ seconds}$$

$$s_0^2 = \frac{\sum_{i=1}^{n} (y_{0i} - \bar{y}_0)^2}{n-1} = \frac{3,3618}{15} = 0,2241 \; ; \quad s_1^2 = \frac{\sum_{i=1}^{n} (y_{1i} - \bar{y}_1)^2}{n-1} = \frac{2,2984}{15} = 0,1532$$

$$F = \frac{s_1^2}{s_0^2} = \frac{0,1532}{0,2241} = 0,68$$

For $\alpha = 0{,}001$ we observe through the table Fisher that $F_{tab} = F_{f_1, f_2, \alpha} = 5{,}5351$, where $f_1 = n\text{-}1$ and $f_2 = n\text{-}1$

So, $F_{calc} = 0{,}68 < F_{tab} = 5{,}5351$.

Thus, $$t_{calc} = \frac{\overline{y_1} - \overline{y_0}}{\sqrt{(n_0 - 1)\cdot s_0^2 + (n_1 - 1)\cdot s_1^2}} \cdot \sqrt{\frac{n_0 \cdot n_1 \cdot (n_0 + n_1 - 2)}{n_0 + n_1}} =$$

$$= \frac{10{,}66 - 11{,}67}{\sqrt{(16-1)\cdot 0{,}2241 + (16-1)\cdot 0{,}1532}} \cdot \sqrt{\frac{16 \cdot 16 \cdot (16+16-2)}{16+16}} = -6{,}58$$

So, $|t_{calc}| = |-6{,}58| = +6{,}58 > t_{tab} = t_{30;0{,}001} = 3{,}656$ for $\alpha \geq 0{,}001$. We observe that, there is a significant diference between the initial test Speed 4 x 10 m and the final test Speed 4 x 10 m, as following of the consumption concerning the iron M.

Table 6. The calculation of the poll dispersion for the initial and final test Endurance 2000 m

No.	Name and firstname	Endurance 2000 m Initial (seconds) (z_{0i})	Endurance 200 m Final (seconds) (z_{1i})	$(z_{0i} - \bar{z}_0)^2$	$(z_{1i} - \bar{z}_1)^2$
1.	B.S.	12'19''	11.00	4.0804	3.0976
2.	M.A.	14'35''	9.19	0.0196	0.0025
3.	S.D.	13'11''	10.24	1.2100	1.0000
4.	C.A.	13''61'	10.08	0.3600	0.7056
5.	N.A.	13'75''	9.31	0.2116	0.0049
6.	B.S.	13'43''	9.10	0.6084	0.0196
7.	H.A.	12'07''	9.35	4.5796	0.0121
8.	C.M.	14'03''	9.07	0.0324	0.0289
9.	P.A.	13'43''	9.10	0.6084	0.0196
10.	C.A.	13'58''	8.38	0.3969	0.7396
11.	C.R.	13'23''	8.58	0.9604	0.4356
12	S.V.	12'05''	11.00	4.6656	3.0976
13	M.I.	14'50''	8.16	0.0841	1.1664
14	T.F.	14'50''	8.45	0.0841	0.6241
15	I.A.	12'50''	8.47	2.9241	0.5929
16	I.E.	13'50''	8.31	0.5041	0.8649
Total		227.32	147.79	21.3297	12.4119

Also, for Endurance 2000 m we apply the test F:

$$F = \frac{s_1^2}{s_0^2} = \frac{\dfrac{\sum_{i=1}^{n}(z_{1i} - \bar{z}_1)^2}{n_1 - 1}}{\dfrac{\sum_{i=1}^{n}(z_{0i} - \bar{z}_0)^2}{n_0 - 1}}$$

where:

$$\bar{z}_0 = \frac{\sum_{i=1}^{n} z_{0i}}{n_0} = \frac{227{,}32}{16} = 14{,}21 \text{ seconds and } \bar{z}_1 = \frac{\sum_{i=1}^{n} z_{1i}}{n_1} = \frac{147{,}79}{16} = 9{,}24 \text{ seconds}$$

$$s_0^2 = \frac{\sum_{i=1}^{n}(z_{0i} - \bar{z}_0)^2}{n-1} = \frac{21{,}3297}{15} = 1{,}42198 \; ; \quad s_1^2 = \frac{\sum_{i=1}^{n}(z_{1i} - \bar{z}_1)^2}{n-1} = \frac{12{,}4119}{15} = 0{,}82746$$

$$F = \frac{s_1^2}{s_0^2} = \frac{0{,}82746}{1{,}42198} = 0{,}58$$

For $\alpha = 0{,}001$ we observe through the table Fisher that $F_{tab} = F_{f_1, f_2, \alpha} = 5{,}5351$, where $f_1 = n\text{-}1$ and $f_2 = n\text{-}1$

So, $F_{calc} = 0,58 < F_{tab} = 5,5351$.

In this way, $$t_{calc} = \frac{\overline{y_1} - \overline{y_0}}{\sqrt{(n_0 - 1)\cdot s_0^2 + (n_1 - 1)\cdot s_1^2}} \cdot \sqrt{\frac{n_0 \cdot n_1 \cdot (n_0 + n_1 - 2)}{n_0 + n_1}} =$$

$$= \frac{9,24 - 14,21}{\sqrt{(16-1)\cdot 1,42198 + (16-1)\cdot 0,82746}} \cdot \sqrt{\frac{16\cdot 16\cdot (16+16-2)}{16+16}} = -13,25$$

So, $|t_{calc}| = |-13,25| = +13,25 > t_{tab} = t_{30;0,001} = 3,656$ for $\alpha \geq 0,001$. Also, we observe that, there is a significant diference between the initial test Endurance 2000 m and the final test Endurance 2000m, as following of the consumption concerning the iron M.

In conclusion, we can to achieve the next table where we can to see the dynamic of the levels for the averages analysed:

Table no. 7 the values of the averages for the tests calculated

TESTS	*THE INITIAL AVERAGE (seconds)*	*THE FINAL AVERAGE (seconds)*
SPEED 30m	***5.01***	***4.85***
SPEED 4 X 10m	***11.67***	***10.66***
ENDURANCE 2000m	***14.21***	***9,24***

- The index of the average level for Speed 30 m:

$$I_{1/0}^{\bar{x}} = \frac{\overline{x_1}}{\overline{x_0}} = \frac{4,85 \sec onds}{5,01 \sec onds} = 96,81 \text{ or } 96,81\ \%$$

We observe that, there is in final period a diminuation of the value concerning the average for Speed 30 m, with 3,19% face to the initial period at the same test, which it means a progress of the footballers from F.C. Otelul Galati team at Speed 30 m.

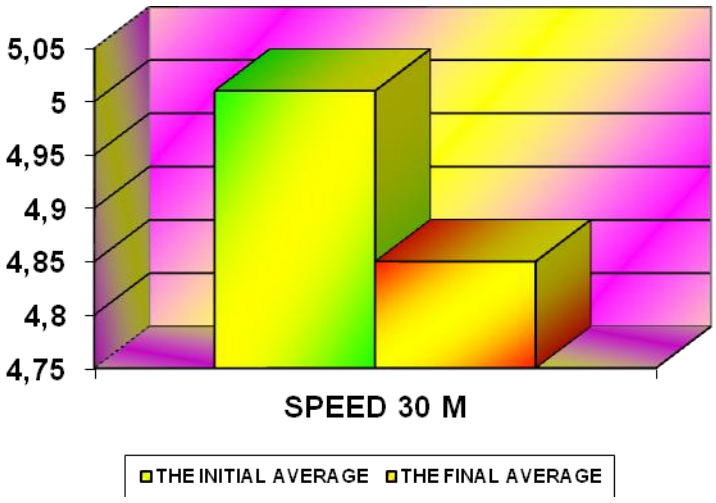

Fig. 1. The evolution of the averages for Speed 30 m

- The index of the average level for Speed 4 x 10 m:

$$I_{1/0}^{\bar{y}} = \frac{\overline{y_1}}{\overline{y_0}} = \frac{10,66 \sec onds}{11,67 \sec onds} = 91,35 \text{ or } 91,35\ \%$$

Also, in the final period there is a subtraction of the value concerning the average for Speed 4 x 10 m, with 8,65 % face to the initial period at the same test, which it means a progress of the footballers from F.C. Otelul Galati team at Speed 4 x 10 m.

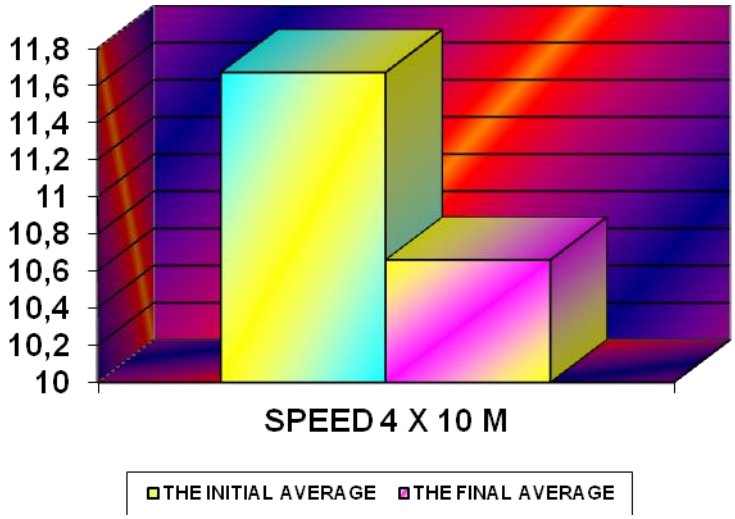

Fig. 2. The evolution of the averages for Speed 4 X 10 m

The index of the average level for Endurance 2000 m:

$$I_{1/0}^{\bar{z}} = \frac{\bar{z}_1}{\bar{z}_0} = \frac{9{,}24\,\text{sec}\,onds}{14{,}21\,\text{sec}\,onds} = 65{,}02 \text{ or } 65{,}02\ \%$$

Thus, there is in final period a diminuation of the value concerning the average for Endurance 2000 m, with 34,98 % face to the initial period at the same test, which it means a progress of the footballers from F.C. Otelul Galati team at Endurance 2000 m.

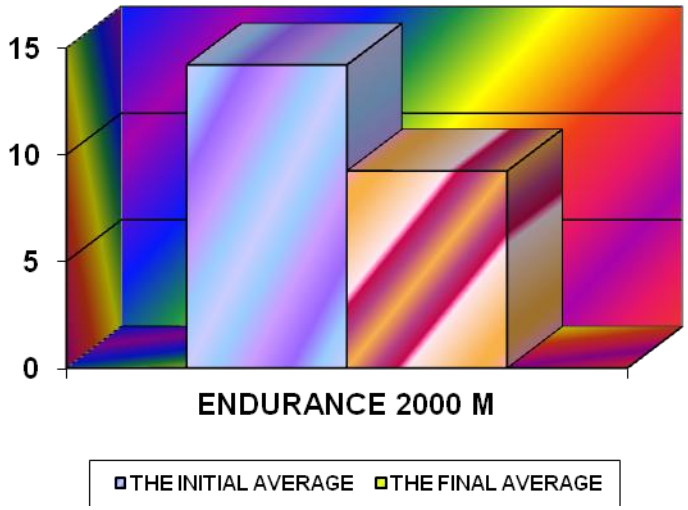

Fig. 3. The evolution of the averages for Endurance 2000 m

CONCLUSION

The meat or the liver and the vitamin C must not to be accompanied with bread or nutriments or drinks, who can to create an obstacle for the absorbtion of the iron. Also, the footballers can to squeeze a lot of lemon over the meat or liver. In this way, it cans to be absorbed miligrams of iron. The footballers, who know that they have the tendency of anaemia, must to reduce the perspiration. So, for trainings, they must to choose the cool hours from day and, also they must to carry easy coats. Also, the programme of preparation musts to be accomplished on certain periods in the limit of possibilities and him duration must to be reduced, while the quality of the training musts to be more important than the quantity.

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