Marathon Training Methods

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BASIC TRAINING

I will begin by skipping over those training methods which, although they have their own importance, we can consider as complementary, and in some cases interchangeable, with other middle distance specialties related to the improvement of muscular efficiency in its various forms. Instead I would like to describe those methods which are able to influence the metabolic bio-energetic systems the most, and how we usually use them in unison.

Essential training points for the marathon are based on two fundamental concepts. One is the increase of the AEROBIC POWER LEVELS, identified more or less by the ANAEROBIC THRESHOLD and its extensive use, so that we are be able to run for a long time at the highest percentage possible.

It's therefore evident that, even if done at different times, it is absolutely necessary to perform workouts which aim to improve the aerobic capacity and raise the anaerobic threshold value (that of 4 mmol/l of lactate). Following workouts which aim to extend one's AEROBIC POWER ENDURANCE we can also identify the extensive AEROBIC CAPACITY.

TRAINING AEROBIC CAPACITY

In order to raise the ANAEROBIC THRESHOLD we have to work above the threshold itself, since by only slightly stressing this mechanism we can adapt to a higher level. Therefore during workouts, we should reach paces that go from 5% to 15% beyond race pace (e.g. from 2.55 to 2.45 1Km. for a 2:08 male marathon runner, and from 3.25 to 3.10/Km for a 2:28' female runner). Then hopefully the central and peripheral components of the aerobic motor will be involved more and more, partially stimulating the production of lactate.

Running faster than the speed that corresponds to 4 mmol/l, we will work a slightly higher percentage of fast twitch fibres (generally speaking FT - type IIa) and can therefore improve the aerobic characteristics of these fibres. This allows the muscles which are involved in running to use greater quantities of oxygen in the same period of time, and this will in turn raise the anaerobic threshold.

At a methodological level, the intensity of the run depends on the total volume of the workouts, or on the total distance covered in each single workout, if they are workouts which are

split up. On table 1 some methods and their quantities are indicated, as well as some examples of training aerobic power and elevating levels of anaerobic threshold.

In order of increasing importance, we first consider the FAST CONTINUOUS RUN (or FAST LONG DISTANCE) done at threshold pace for 20 - 40 mins. (7-14 km). Similar objectives are used for the FAST PROGRESSIVE RUN, in which the athlete starts out slow but finishes with a faster pace, influencing in a more massive sense the area above the 4 mmol/1 mark.

METHODS	QUANTITY	EXAMPLE (2H.08 M/2H.28'W)
FAST CONTINUOUS RUN	Time: 20'-40' Speed: 104-107% M.P.R	10km. (29'2920")10km. (33'/33'30")
FAST PROGRESSIVE RUN	Time: 20'-40' Speed: 102-108% M.P.R	12km. (35'/20")10km. (9'05"/8'45"/8'35")
LONG SPEED VARIATIONS	Distance: 5000/7000m Volume: 15-21 Km Speed: 103-107% R.M	3x5000m. increasing speed(17'15"/17'/16'45") Rec. 3'
MEDIUM SPEED VARIATION	Distance: 3000/5000m Volume: 10-12Km Speed: 105-108% R.M	5000/4000m/3000m. (14'30"/11'25"/8'20") Rec.3'
SHORT SPEED VARIATIONS	Distance: 100/5000m Volume: 10-12Km Speed:106-110% R.M	10x1000m at 2'45" rec. 2'5x2000 at 6'30" rec.3'3000 (8'15") rec.4'+
MIXED SPEED VARIATIONS	Distance: 400-3000 Total Volume:10-12Km Speed: 107-112% R.M	2000 (5'25") Rec. 3 +10x400m (1'02") Rec. 1'8km. even paced with heart rate
CONTINUOUS UPHILL RUN	Distance: 6-10Km Grades: 3%-6% Distance: 6-12	Equal to that of the fast continuous run
COMPETITION	Cross/Road/Track	10.000m track in 28'15" 5.000m track in 15'45"

Table 1: TRAINING AEROBIC POWER (Methods, - quantities workload examples)

On a practical level, this type of workout is generally done on a Sunday so that it can be substituted at times with cross country or road races. In fact, what could be better for a marathon runner training his aerobic capacity than a 10 or 12 Km. race? This period dedicated to short distance races is obviously related to the marathon distance. We then have different types of CONTINUOUS RUNS WITH VARIATIONS. In this case the intensity of the pace will be determined by the total volume of the workout and the distance to run: Shorter distances have less total volume of the workout and the distance to run, and vice-versa for the longer distance. We then move slowly from the longer variations to the middle and then shorter distance. Due to the increase in speed during these tests we move into the anaerobic area even more, with

consequently more lactic acid production and accumulation. Over a period of time the ability to reduce the length and increase the pace during intervals in the different tests means a growing ability to get rid of the lactate that forms, which is an essential stage in the training of AEROBIC POWER ENDURANCE.

Another type of workout that we often do for the development of aerobic capacity and strength resistance is the FAST CONTINUOUS UPHILL RUNS - done at an even pace and in progression. We choose grades that are not excessive (from 3% to 6%) and over a distance of 6 - 10 km. Based on what we have seen in the past few years, this type of workout has always given excellent results in all the athletes who have used it, since it combines a muscular and organic physical workout together. It thus represents one of the most accepted workouts for improving aerobic capacity.

Training Aerobic Resistance

If AEROBIC POWER makes up the quality base for marathon runners, AEROBIC RESISTANCE can be considered the quantitative base for this speciality. The continuous increase in the number of kilometres run, be it in the first years of one's career or those run in a season, is essential for improving the resistance to the aerobic mechanism, i.e. the capability to last longer. It is however important to consider the following:

Once it was thought that running a lot of mileage at a slow pace, ending up with the so called capillarization, was an essential passage towards developing quality workouts. Instead, today we believe that running at very slow paces, those slower that the marathon race pace, do not actually mean training to improve aerobic resistance. It is only a general 'base' from which one can start to develop workouts for SPECIFIC RESISTANCE or AEROBIC POWER ENDURANCE, muscles and joints to work together for long which have proved to be the real key to middle distance running in the last few years.

It is still important with the young athlete however, to do a fair amount of mileage at low intensity, as they do not as yet have a solid work base. But when we are dealing with highly developed athletes, resistance in terms is a big misunderstanding. With a highly developed athlete, running at a pace 25 - 30% below aerobic threshold (2mmol/I) means that absolutely no resistance is developed.

There are, however, many kilometres the athlete will run at a low intensity, but these will be more concerned with regeneration and are not part of the real resistance workout They are, in fact, what we normally call 'recovery runs' and which are placed among those workouts with more particular demands. Another time when the highly developed athlete runs at low intensity, usually far from the special periods when the athlete trains the muscles and joints to work together for long periods of time (up to 3 hours), usually when he is alone so that he can 'listen to his body', and concentrate without waste of energy. This a type of workout was considered necessary for Gelindo Bordin (1988 Olympic Champion), Ornella Ferrara (bronze in the '95 World these

Champs.) and Franca Fiacconi (2nd in New York in '96). But it was not favoured by Stefano Baldini (Champion in the half-marathon '96 and 2nd in London '97 with 2:07.57), Giacomo . Leone (NewYork Marathon '96 winner), Danilo that Goffi (4th in '97 World Champs.) and Maria Curatolo (silver in '94 European Champion- ship). This last group are, co-incidentally, runners who were less able to concentrate for long periods. Methods, proportions and respective examples are given in table 2. . The first method examined is the MEDIUM PACED PROGRESSIVE RUN, which is done in a time limit of 1 hr. to 1 hr. 30' at a speed relative to marathon race pace (M.R.P) which varies from an initial 85% to the final 100%. This workout, good - even if not high in intensity of effort, is done at around the same level as the anaerobic threshold. The 'medium paced progressive workout' therefore is an adequate support to workouts of 'special endurance at marathon race pace' and are done in the following period.

METHODS	**QUANTITIY**	**EXAMPLE (2h.08'M/2h.28'W)**
MEDIUM PACED PROGRESSIVE RUN	Time: 1hr-1h.30' Speed: 85-100% M.P.R	1h.30'(30' at 3'30" + 30' at 3'20" + 30' at 3'10")
MEDIUM-FAST PROGRESSIVE RUN	Time: 45'-1h' Speed: 95-105% M.P.R.	55' (20' at 3'40" + 20' at 3'30" + 15' at 3'20")
MEDIUM EVEN PACED CONTINUOUS RUN	Time: 1h 1h 30' Speed:90% M.P.R	1h.30' at 3'20"/km1h.30' at 3'50"km
LONG RESISTANCE RUN	Time 2h.15'-3h Speed: 80% M.P.R.	2h.45' at 3'45" (44km) 2h50' at 4'15" (40km)
LONG RESISTANCE WITH SHORT VARIATION	Time: 1h.45'-2h.15' variations: 500-1000m Base speed: 80% M.P.R. Variation speed 100% M.P.R.	1h even paced +10 x 1'30" Rec. 1'30" +30" Even paced
LONG RESISTANCE WITH LONG VARIATION	Time: 1h.45'-2h.15' Variations:3-7Km Base Speed: 80% M.P.R. Variation speed: 100% M.P.R.	30' even paced +7000/5000/3000m Rec. 10' slow paced running +20'/40' even paced
CONTINUOUS ROLLING HILL RUN	Distance: 18-30Km Grades: 3%-6-%	2h running with 3-4 long and continuous uphill and downhill

Table 2: TRAINING AEROBIC RESISTANCE
(Methods– quantities, workload examples)

If they are done for a reduced amount of time, but at a slightly higher intensity, the running pace is close to that of a fast distance run. Then the workout is modified into a MEDIUM-FAST PACED PROGRESSIVE RUN - which is similar to the medium progressive, but shifting towards more intensity.

With the MEDIUM PACED CONTINUOUS RUN lasting between 1hr and 1hr 30' and run at an even pace, the athlete has to work more at a high level of his extensive mental concentration.

The pace will be approximately 90% of race pace. It is not a difficult workout, but it still has its importance in certain periods.

The so called LONG RESISTANCE RUN (specific for marathon runners), done at a pace equal to 80% of M.R.P., is essential from both the point of view of mental concentration and the adaptation of the muscular structure, tendons and joints to long distance running. It is a workout that the athletes love to do in a natural setting, without any particular controls, and which usually creates a feeling of well being and relaxation for the marathon runner since it is not very difficult to do on a bio-energetic level.

With the intention of preparing the body better to training its resistance to the race pace, it is advisable to do a few trials ahead of time at different distances and varying intensities. This can be done at a similar pace as the 'LONG RESISTANCE RUN'. in order to stimulate the metabolic and biomechanical components towards running at race pace. This is the purpose of the 'LONG RUN WITH SHORT OR LONG VARIATIONS' which are performed for a rather 10mg period of time and which represent a first approach to a special workout inserted in a general context.

Finally, great importance is given to the continuous 'RUN ON ROLLING HILLS'. These have the purpose of increasing muscular resistance and strength. At the same time this method works the muscle fibres in a more complete way since the type of eccentric muscular contraction that is used in running downhill tends to increase muscle strengthening capabilities.

TRAINING OF SPECIFIC ENDURANCE IN THE MARATHON

'The Specific Preparatory Stage' in the strict sense of the phrase lasts for about 6-8 weeks as illustrated in Table 3. In this space of time, which may vary depending on the type of athlete and the type of work done prior to this period, the athlete must intensify the quality of the work previously developed, trying to bring his SPECIFIC ENDURANCE at marathon pace to the highest level.

The concurring development of aerobic capacity and aerobic resistance in the previous phase must now be finalised. Considering both of these, neither is completely indicative. In fact an elevated aerobic power does not mean that the athlete is able to run a fast race. It will therefore be a matter of developing in the last phase the characteristics of EXTENSIVE AEROBIC POWER (if the athlete starts off from a high anaerobic threshold level) or INTENSIVE AEROBIC ENDURANCE (If the athlete starts from a high level of general resistance).

METHOD	QUANTITY	EXAMPLE (2h. 08' M/2h. 28'W)
MARATHON PACED RYTHM	Distance :18-25km	Half - marathon race at M.P.R.
SPECIFIC EXTENSIVE ENDURANCE	Distance: 19-30km Systems Long Repeats 2-7km (100-102% M.P.R) Rec. 1 km (85 -95% M.P.R)	4x5000, at l5' Rec. 1000m at 3'10"/3'15" 3 x 7000m at 24'30' Rec. l000m at 3' 48"/3'55"
SPECIFIC INTENSIVE ENDURANCE	Distance: 15-23km System Short Repeats 0.5 - 1 km (103% MPR) Rec. 0.5-1km (97% M.P.R)	8xl000m at 2'55" Rec. 1000m at 3'05" (16 km) 20 x 500m at 1'42" Rec. 500m at 1'55" (20km)
SPECIFIC ENDURANCE LONG RUN	Distance: 30-35km Speed: 98-100% M.P.R	32KM AT 3'06" (1h 39') 35KM AT 3'40" (2h.08')
SPECIFIC MARATHON PACE BLOCK	Distance:10km (85% M.P.R) +10-15KM (100-103% M.P.R.) System: Morning workout Repeated in the afternoon	10km at 34' + 12km at 36' (AM + PM) 10km at 40' + 15km at 52' (AM + PM)

Table 3: TRAINING SPECIFIC MARATHON ENDURANCE
(Methods - quantities, work load examples)

This can be identified, in the end, also under methodological aspects. In short it means, to extend one's own capacity to withstand a fast race pace.

In this period the term 'race pace' becomes of fundamental importance. Everything rotates around this one element: the body must learn to use an even lower quantity of glycogen, so as to give the possibility to last longer at this correct pace.

The first method that we use is 'MARATHON PACE'. As the name implies, it is the most specific type of workout used for acquiring a correct rhythmic sensitivity, which is of utmost importance for improving the initial phase of the race. It is performed at exactly the pace the athlete will use in the marathon, at an exact distance of 12 Km. Participation in a half marathon race run as a 'passage race' takes on exactly this meaning.

One of the methods used most in the modern methodology consists of a workout of 'SPECIFIC EXTENSIVE ENDURANCE'. This type of workout has today achieved great significance in our methodology. Two such examples are given in the boxes at the bottom of the page.

Usually, in terms of time, the development of 'specific extensive endurance' begins with a reduced mileage (e.g. 5 x 3000m with a recovery of l000m for a total of 19 km), and to then extend both the number of repeats (6 x 3000m, - rec. l000m) and the total distance to 23 km) This

continues with variations such as (4 x 5000m - rec. 1 000m or 3 x 7000m - rec. 1 000m, ending with 5 x 5000- rec. 1000 m)

A more intense method which we use is the 'Specific Intensive Endurance workout. With this type of workout the total distance is slightly reduced, while the pace is much faster. The workouts given below for (1) Stefano Baldini, (2) Giacomo Leone (before winning the New York Marathon) and (3) Maria Curatolo, illustrate this:

1. 10 x l000 in 2mins.53
   Recovery: 1000 in 3 min=19 km. in 56mins. 23" (average of 2:58"/km)

2. 6 x 3000m in 9:12, 9:06, 9:01, 8:55, 8:49, 8:42
   Recovery: l000m in 3:15 to 3:18=23km.in 1h.10' 12" (Average of 3:03/km)

3. 20 x 500 in 1:39.5"
   Recovery: 500m in 1:51" to 1:52" =19 km. in 1h 10' 22" (Average of 3:31/km)

The 'Specific Endurance' workouts make up an extension for aerobic power. On the contrary, the 'SPECIFIC ENDURANCE LONG RUN' can be considered an intensive qualification of the aerobic resistance. Before a marathon, this method is not used for more than three workouts, with ample recovery time between each session. In fact, if it is to be utilized correctly, this type of workout requires a well-rested physical condition (it must therefore be done after adequate 'tapering' with particular attention paid to recovery. For the analogy at a bio-energetic level with the marathon, it is utilized as a simulation of the race, using all the most important particularities during the race (from the hyper glycogen diet in the last days to getting the athletes used to drinking often). Usually, for ease and comfort we do this test in an actual marathon race.

Not everybody uses the so called 'SPECIFIC MARATHON PACE BLOCK', which is a special type of work out in running the first part with a distance of 12 Km. at 85% of race pace. The second part is followed with a 10-15 km run at marathon race pace or slightly above it. This type of workout is repeated twice in the same day (morning and afternoon) which is why it is considered a 'Specific Block'.

The genetic differences between various athletes and their level of preparation allows them to use different types of 'Specific Blocks", depending on the effects it was desired to obtain, either with the extension of aerobic power' or the 'aerobic resistance'.

At the top of the next column there are three examples of Specific Blocks which were used with different athletes for different purposes.

Even with variations made according to personal characteristics, it is evident that our concept of specific workout is meant more for 'extending' the ability to run at lengths of time at race pace

for shorter distances. So, it is the concept of ‘AEROBIC POWER ENDURANCE’ that can be fully applied to the ‘SPECIFIC MARATHON STAGE’

As the race period slowly approaches, we prefer to define the pace that the rest intervals should be run, to bring it as close as possible to race pace as the event approaches, rather than emphasizing a faster pace. This strategy aims at piloting workouts towards ‘SPECIFIC ENDURANCE’.

This type of session has a great importance, apart from helping the metabolic changes, since thy help the athlete to know and feel and then interpret more precisely different paces relative to his own sensations to the different levels of difficulty.

Therefore, they also assume an important technical importance, preparing the athlete for eventual accelerations during the race, either from adversaries or course changes such as uphill, or downhill and favourable or unfavourable wind conditions which he must know how to deal with. He has to learn that he is running at a pace which is faster then what he can handle, and he must be able to make up for it during the race without having to pay for it later.

Rhythm exercises are essential for two basic reasons: one is biomechanical in nature, so that the athlete can find the correct balance between the necessary muscle tension and the most economical technical movement, in order to expend less energy in the action of running. The other is of a bio-energetic nature, since muscle fibres have to adapt themselves to ‘building’ and by best utilizing the optimal fuel by a mix of sugars and fatty acids in order to finish the race without a drop-off in performance.

Some athletes (like Gelindo Bordin and Ornella Ferrara) feel the need to run, at least once in the month that precedes the race, a distance superior to that of the race at a relatively fast pace (92%-94% M.R.P.). Before Seoul, on September 14, 1988, Bordin ran in Tirrenia for 46 km in 2hr. 41’ with the last 10km covered in 31 mins. Similarity, 19 days before Goteborg, Ornella Ferrara did a ‘long run’ of 45km with rolling hills in 2hr. 51’, passing the marathon mark in 2hr. 40’. Also Maria Curatolo, before the Seoul Olympic Games where she came in 8th, did two long runs of 45km. with the first finishing in 2hr. 59’ and the second in 2hr. 56’. This type of workout cannot be considered an habitual method of preparation, and it can not always be used, since often the negative implications are greater than the eventual benefits.

IN CONCLUSION

We believe that the objective in marathon training can be summed up in the following points:

- Reduced glycogen consumption at race pace.
- Increase the speed at which muscle lactate is assimilated.
- Improve bio-mechanical efficiency and consequent performance.
- Prepare body and mind to be able to last for the necessary amount of time at race pace.

To achieve these objectives identified, above, it is necessary, however, to be able to manage well the PERIODIZATION and the strategies for approaching the race.

PERIODIZATION

When we start the preparation for a marathon, we usually set up the workouts following a consolidated scheme that will utilize three differentiated cycles. These cycles take into consideration both the objectives and methods used, depending on whether the athlete has not run a marathon for a long time, or whether he has run one at a good level more recently. In the second case, it will be appropriate to skip over the first cycle, which is of introductory in nature. Usually we can identify three periods (or stages) as follows:

1. GENERAL PREPARATORY STAGE
2. FUNDAMENTAL PREPARATORY STAGE
3. SPECIFIC PREPARATORY STAGE

In the General Stage that lasts from 6-8 weeks we work towards increasing muscle efficiency through running technique exercises and gym sessions. In the sessions we pay particular attention to muscular extendibility and joint movement, and by increasing aerobic resistance through various types of continuous runs, whether they are at slow, medium, or progressively performed pace.

In the Fundamental Stage which lasts from 8-10 weeks we introduce the concept of Aerobic Power Endurance reaching a high volume of mileage, emphasizing lasting muscular efficiency, and beginning the preparation for the distance at a physical and mental level. The ‘internal load’ is observed with more care through clinical controls and field evaluations. We tend to prod the organism with a series of stimuli, often mixed together, to provoke a general reaction on a compensation level. The training does not appear to be too modulated, but consistency and continuity in the workload is important. Often the athlete will reach a general state of fatigue that will prevent muscular freshness, but this is a normal passage during this phase, and should not be considered a sign of poor conditioning or, on the other hand, over training.