SHORT-TERM PREPARATION FOR MAJOR COMPETITIONS

By Alfons Lehnert

Statistics reveals that only a small percentage of athletes reach their peak in time for important competitions. In the following text the author, who worked over 20 years in the Sport Research Center, Leipzig in the former German Democratic Republic outlines procedures aimed to peak at the desired moment. The article appeared originally in Leistungssport, Germany, Vol. 24, No. 1, January 1994. This slightly abbreviated translation is reprinted from A Collection of European Sport Science Translation, edited by Jess Jarver and published by the South Australlan Sports Institute. Re-printed here with permission from Modern Athlete and Coach.

INTRODUCTION

An analysis of the dynamics of Olympic performances that can be objectively evaluated shows that only a very limited number of athletes (about 20%) reach the year's best performances in Olympic competitions.

Those who do have a nearly systematic improvement throughout the competition season to reach their peak in time for the Games, follow through with an immediate drop in performances (Fig. 1). On the other hand, athletes who fail to produce their best at the Games can be divided into the following categories:

- Athletes who reached high level performances at the start of the season followed by a steady decline and relatively poor Olympic performance (Fig. 2).

- Athletes with a steady improvement during the season to reach peak performances 4 to 6 weeks prior to the Games, followed by a significant drop. (Fig. 3)

In order to find a solution to the problems responsible for the failure of athletes to reach top form for the most important competition of the year, we decided to look for answers to the following questions:

1. What are the possible reasons for the failure to reach peak performances at major competitions?

2. What possibilities could be available to increase the number of athletes who are able to produce their best performances at major competitions?

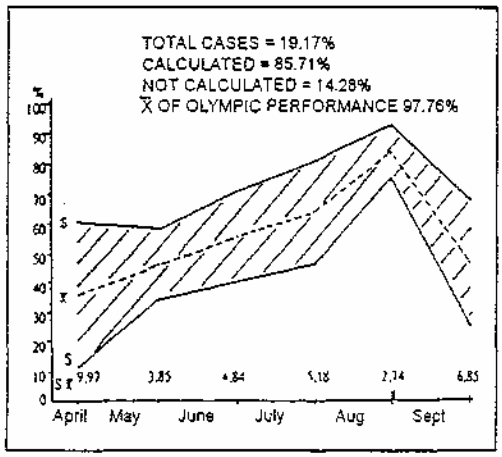

FIG. 1: Performance graph of Group I athletes.

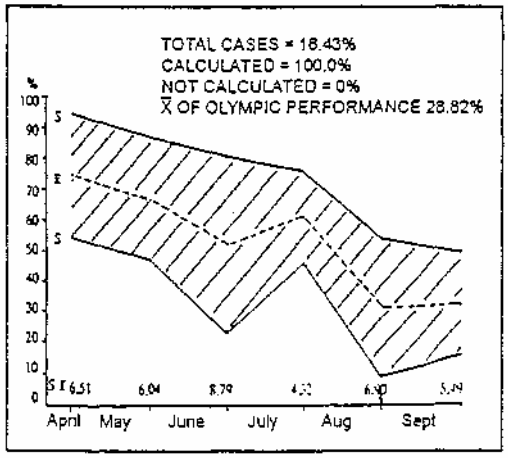

FIG. 2: Performance graph of Group II athletes.

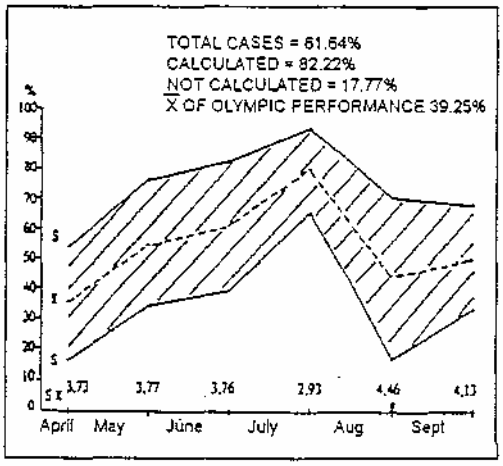

FIG. 3: Performance graph of Group III athletes.

GENERAL EVALUATION

The methods used in the preparation training of the athletes involved in the study allowed us to come to the following conclusions:

- The preparation of Group I athletes - best performance in the major competition - corresponds to the planned aim and is in principle correct.

- The preparation of Group II athletes - best performance achieved at the beginning of the season - is in view of the planned aim to peak at the Games far too early and indicates an incorrect training plan for the year.

- The preparation of Group III athletes - best performance 4 to 6 weeks before the expected decisive peak - is essentially correct, but shows mistakes made in the short-term preparation for the main competition.

As the athletes in Group III appear to have realistic possibilities to perform successfully in the major competition of the year, we decided to take a close look at the reasons for their performance decline shortly before the main competition. The analysis revealed the following essential reasons:

- An early start to sport specific training in order to reach qualification norms or selection trials, held too early by the sporting associations. This made it virtually impossible to maintain form in the absence of a new preparation phase.

- A low performance level from an international viewpoint. For these athletes, reaching qualification standards, or being selected to the team, represented the highlight of the year. What followed was a psychological decline in the stabilization of performance and the athletes became “tourists” at the Games.

- The training and competition structure in the last few weeks prior to the major competition has shortcomings that upset a systematical competition specific preparation of the athletes.

- An insufficient methodical and psychological preparation for the concrete and complex conditions expected at the site of the main competition.

We worked out a hypothetical training concept for the last stages of preparation for major competitions. The concept was based on the positive (group I) and negative (group II) experiences and led us to the following basic conclusions:

- Personal top performances at the time of a major competition required the highest possible individual loads in the final preparation stage.

- The decisive factors that determine the performance are the training exercises, the methodical formation of training and the correct training loads. These single elements have in their characteristics, as well as in their temporal aspects, different influences on the performance limiting factors and a different transition time.

- The bionic organs and functional systems that are influenced by training have their own adaptation dynamics. It is therefore important to discover the optimal adaptation processes of these factors in preparation for a personal best performance at a major competition.

- The accomplishment of a competition performance often occurs under different environmental, geographical, climatic, emotional and technical conditions. These can have a positive, as well as negative, influence on the performance. An optimal adjustment to these conditions is a prerequisite for a good performance in a major competition.

STRUCTURE OF SHORT-TERM PREPARATION

The following methodical tasks have to be solved in the immediate competition preparation phase:

- Conditioning tasks — Development or stabilization of an optimal physical conditioning level for an effective conversion to technical and tactical capacities, as well as proficiency in overcoming the total physical demands during the course of competitions.

- Technical preparation — Perfection of the technique, correction of minor technical shortcomings and stabilization of technique under competitive conditions.

- Tactical preparation — Planning and stabilization of the concept of competition control, taking into consideration the specific conditions at the competition venue and the expected tactical behavior of the opponents.

- Development of the complex performance

    - Refinement of physical, technical and tactical performance components combined with psychological preparations for the forthcoming competition.

A correct choice and sequence of training means and the corresponding training loads and intensities are decisive in reaching the top performance at a certain time. The organization of training means (load, recovery, volume, intensity) relies upon the understanding of the different training effects and the transformation durations of single training complexes, as well as the adaptation dynamics of the performance deciding biotic organs and functional systems. Here, study results

indicate that load components on the general development of the organism require a longer conversion time than specific load components that transfer faster into super-compensation.

Top performances at a certain time depend on correct content and temporal sequence of the essential elements of training. According to our experience, peak loads of the single training components should occur before the planned competition as follows:

- general training means: 5 to 4 weeks,
- training volume : 4 to 3 weeks,
- specific training means : 3 to 2 weeks, and;
- training intensity: 2 to 1 week prior to the competition.

The maximum load takes place in the third and second week before the competition — in the following proven structure:

Recovery Phase — Duration about one week

- A short, active, above all psychological, recovery. This is particularly important when the major competition takes place late in a demanding season.
- Means: General training, other sport, physiotherapy.
- Load: Mediocre with low intensity.

Preparation Phase — Duration 2 to 3 weeks

- Mainly physical conditioning, technical and tactical preparations.
- Means: Specific training exercises.
- Load: High volumes with medium intensity.

Final Development Phase — Duration 1 to 2 weeks

- Final preparations, firstly in a domestic situation, later under strictly competitive conditions.
- Means: Predominantly specific competition exercises.
- Load: Restricted or medium loads with close to competition intensity.

Competitions play an important part in solving the final training problems in the immediate competition preparation phase. They are used as control exercises to determine the level of relevant performance factors and allow for the stabilization of technical and tactical conceptions. Competitions that aim for top level performances should be avoided in this phase because they can have a negative influence on the decisive competition.

PREPARATION AND ADAPTATION TO SPECIFIC COMPETITION CONDITIONS

Scientific and technological advancements, particularly fast inter-continental travel, have contributed to a situation where Olympic Games, World Championships and other major competitions may take place in the far north (Montreal), far south (Sydney), far east (Seoul) and far west (Los Angeles), as well as at sea-level (Barcelona) or medium altitude (Mexico City). In order to reduce, or even eliminate, the negative influence of unfamiliar conditions at the competition venues it is necessary to find ways and means to prepare athletes to unaccustomed environments. For this reason the immediate competition preparation phase intricates the following tasks:

Adjustment to a Changed Day-Night Rhythm.

The accustomed day-night rhythm is changed during travel involving five to six hour time shifts. This makes adjustment to the type of competition venue necessary, and requires a biological adaptation that takes four to five days. The following possibilities are available:

- Travel takes place five to seven days prior to the competition and is followed by an immediate change to local time on arrival.

- A step by step adjustment, with stopovers on the way to the competition venue. This version takes more time, extends the adaptation processes and involves higher costs.

There is also the risk of not having optimal training conditions available at stopovers.

A simple change to the time of the competition venue at home before the departure is not successful because the day-night rhythm is influenced not only by the time, but also by daylight.

Extreme Temperature and Humidity Values

Both of these climatic factors depend on the geographical position of the competition venue and the season. Competitions can therefore take place under the following extremes:

- High temperatures and high humidity (coastal areas in warm regions).
- High temperatures and limited humidity (continental climate and altitude in warm regions).
- Low temperatures and limited humidity (continental climate in cold regions).

While extremely high temperatures occur mostly in summer sports and create, above all, problems to endurance activities, extremely low temperatures can besides winter sports, also affect summer sports. Extreme climatic conditions affect the temperature regulation of the organism, and with it, water and electrolytes levels. This creates specific demands on clothing, conduct in competition, nutrition, water intake and so on. The following possibilities are available for adaptation:

- A simulation of the expected climatic conditions at home by using a sauna, and training in climatically controlled chambers.
- Organizing a part of the preparation at climatic conditions that are similar to the competition venue.
- Properly timed arrival at the competition venue.

Adaptation to Medium Altitudes (2000 to 3000m)

Climatic conditions at altitude create numerous problems to some high performance athletes because of the lower barometric pressure, and consequently a lower 0_2 partial pressure. The reduced 0_2 contents in the air has a negative influence on energy release and therefore affects negatively on sporting activities that depend mainly on aerobic metabolism. The higher the intensity level of aerobic processes, the higher the negative influence.

On the other hand, performances that depend predominantly on anaerobic metabolism can, due to reduced air resistance, expect to be positively influenced (sprints, horizontal jumps).

The following possibilities are available for adaptation to the conditions at medium altitudes:

- An emphasized intensive endurance training at sea level. Hypoxic training under normal conditions has a similar effect to altitude training — increased resistance to hypoxity and an efficient realization of available oxygen.
- Training under simulated lack-of-oxygen conditions at sea level, using pressure chambers that allow to regulate air mixtures.

- Training at similar altitudes to the competition venue.
- Properly timed arrival at the competition venue.

A combined need for training stimulus and acclimatization increases the training load at medium altitude in comparison to sea level training. This must be taken into consideration during the first eight to ten days of the acclimatization phase. The intensity in endurance training must be reduced, and longer recoveries should be allowed in explosive activities.

An optimal adaptation period to altitude is between 18 and 21 days. This duration represents a compromise between physiological adaptation and psychological compatibility to the new environment.

In general, it can be recommended to employ the following variation for a short-term preparation to compete at altitude in events where endurance is the deciding performance component:

- Pre-acclimatization : 7 to 4 weeks before the competition.
- Home training interval : 4 to 3 weeks before the competition.
- Arrive at the competition venue : 3 to 2 weeks before the competition (Fig. 4).

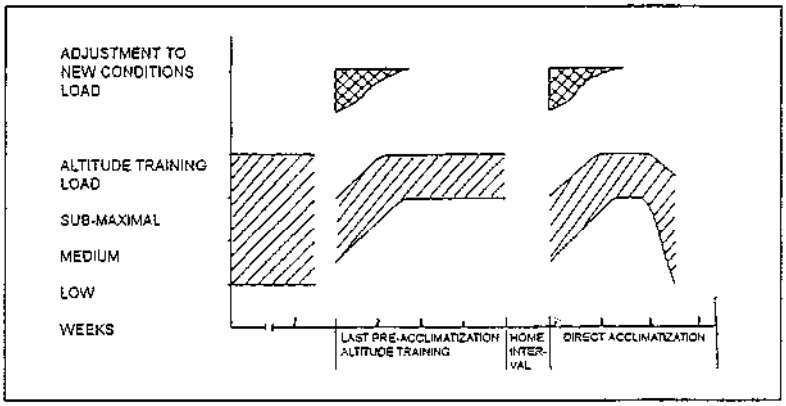

FIG. 4. The general trend of the training load in the acclimatization period.

OTHER ADJUSTMENTS

Competition Procedures

Major competitions are rarely limited to only one start. Most are made up from a whole series of starts (qualifications, heats, quarter- finals, semi-finals, finals etc) which are conducted according to different timetables.

It is therefore important to prepare and adjust athletes to the different types of competition procedures to enable them to reach and to maintain a high performance level throughout the competition — from qualification rounds to the final. This can be achieved by several competitions of the expected procedures during the immediate competition preparation phase.

Departure

The departure time to the venue of a major competition varies and is determined by the following circumstances:

- Departure to the competition venues that take place in the athletes' own country, or places where conditions are well known, and require only short traveling time, can take place a day before, or even on the day of the competition.

- Departure to competition venues that require no time zone adjustment, nor acclimatization, and involves no extreme travel fatigue, should take place three to four days before the competition. The extra days allow athletes to become familiarized with the competition conditions.

- Departure to competition venues that require adjustments to the local time zone, or adaptation to climatic conditions, should take place six to seven days before the competition.

- Departure to competition venues at medium altitude should take place seven days before the competition for athletes involved in speed strength and technical activities and 14 to 18 days before the competition for endurance athletes. Pre-acclimatization allows a reduction in time for endurance sports.