

TRENDS IN JAVELIN CONDITIONING

By Jimmy Pedemonte

Italian throwing coach, Jimmy Pedemonte, discusses contemporary trends in the physical conditioning of javelin throwers with selected examples of methods employed in different European countries. The article is an edited extract of the author's address to Australian throwing coaches at the Australian Institute of Sport in Canberra. Re-printed here with permission from Modern Athlete and Coach.

Javelin throwing belongs to a group of events in which in a short time a change of the biokinetic chain takes place, with an immediate increase of the effort in the final part. These technical exigencies do not only require a good special physical preparation, but also a high level of co-ordination that can influence the mechanisms that govern the movements and that allows the full exploitation of the potential strength.

Consequently, it is necessary to establish an optimal combination of training methods that can improve the level of development and the quality of the movements. Particularly important are the training methods characterized by the increase (volume and intensity) of the special components of training. Many Soviet and foreign authors are convinced that the real heart of the matter is to establish methods and means that lead to a balance between the improvement of explosive strength and the development of the technical movements.

Trends to adopt methods aimed at the indiscriminating increase of training volume and intensity do not lead to effective results. This is the reason why in theory and practice several different methods exist. Many athletes use low or medium loads, executed quickly or with medium speed. Some use medium loads until failure, while others use high loads, up to 85-95% of their maximum, taking care that there are favorable conditions for the nervous co-ordination. As it often happens, the truth lies in the middle.

Today it is considered that a change in the weight training loads is the best way to improve explosive strength. Soviet physiologist, Golinievsky, claims that we can change the nature of stimuli (mechanical, chemical, physical) but this is not perceived by the organism that reacts to the change of the intensity of the stimuli. In explosive events, like the javelin throw, the most utilized methods are therefore based on fast movements, circuit training, concentric and eccentric contractions and others.

However, the most effective way to improve fast strength is to use the varied method, that is to use exercises characterized by different types of muscular tensions. The variation of methods can follow a wave-like course or a sharp, clean change in the succession of loads applied during the various stages of the yearly training cycle. In the Soviet Union, elite javelin throwers widely use methods that incorporate high, medium and low intensities of the training load. This training method, because of the frequent changes, avoids the negative reaction of an organism to repeated, stereotyped stimuli and increases its efficiency.

STRENGTH AND TECHNIQUE

In events like the javelin the problem of increasing explosive strength is successfully solved through the improvement of strength, because strength leads to an increase of speed against resistance. This correlation is explained by the physiological connection between the development of strength and speed. The same principle is true when training with light and heavy implements. The monotonous use of light and heavy implements during the various stages of training can lead to a unilateral development which is detrimental to the basic technical model.

The investigation about the best methods for the improvement of strength should be directed to the attainment of a balance between strength improvement and the betterment of the technical components of the performance. In other words, the objective is to build up a functional mutual co-operation between technique and strength, so that technique is developed on a positive and favorable functional basis.

Dmitrussenko has undertaken important research on this topic. In the past the Soviet javelin throwers used during the preparation period (from November to April) loads close to 80% maximum, with 7-8 repetitions in each set. During the competition period (from May to September) they moved to higher intensities, up to 95%, with 2-3 repetitions in each set. From this situation they deduced that during the preparation period strength improved because of an adaptation of a vegetative type medium intensity load that enhances the increase of muscular mass.

During the competition period, when sub-maximal intensities were used, strength improved because of a better nervous regulation, that is, a recruitment of more motor units that were better synchronized. So, different methods correspond to different contributions to improved strength. In accordance with this principle it has been established that the alternation of a series of methods can lead to a more optimal development of strength in relation to javelin throwing. This method is called the "mixed method".

An experiment was conducted on two groups of javelin throwers, where the control group followed the traditional method and the other group the mixed method. The experiment was verified through 60 tests, among them standing throws with implements of different weight, the speed of the throwing arm without any resistance, the strength of the fundamental muscular groups, the deviations from the technical model, the time for the run-up according to the change of weight of the implements and, of course, the standard throw at full effort. The results showed that training with low intensities must be done during the first part of the preparation period, when the aim is to increase the muscle mass, and when the athlete trains twice a day.

The experiment also indicated that high intensity loads must be exactly programmed, otherwise results could be negative. Therefore, high intensity strength training in the morning and technical work in the evening is considered inefficacious and detrimental to the technical progress. On the other hand, the mixed method has led to a great increase of static and dynamic strength, especially after a 24 hour recovery. It is important to point out that the frequent change of methods, typical of the mixed system, doesn't cause a negative influence on the temporal and rhythmical organization of the run-up.

Of course, there are also problems concerning the development of specific throwing strength. On this topic investigations are conducted all over the world. Experts try to pick our specific exercises with weights that reproduce the structure of the competitive movement and its dynamical character. Throwing implements of different weight are included in this. In the Soviet Union specific exercises are, above all, used according to the mixed method, within the single session, or during a group of sessions. In the first case they avail themselves of the delayed effect of training because of the previous weight training (cumulative effect). In the second case the development of technical movements is connected with blocks of speed or strength.

It is very interesting to note that the Soviets also use the isometric method for the improvement of the release speed. They use exercises performed at full intensity for 1.0-20 seconds. These skills improve explosiveness and the capacity of relaxation of the muscles.

EUROPEAN INFORMATION

Now to some additional information on the conditioning of javelin throwers in European countries.

West Germans include speed training sessions in the program two to three times a week. One of these workouts includes running with the javelin. Several forms of running drills are performed in the beginning of the preparation period because running technique improves the run-up with the javelin. The runs are usually over 30 to 60m and 100m.

During the competition period each sprint is timed. Top German javelin throwers run 30m to 3.5 to 3.7 sec. and some are capable of the 100m in less than 11 sec. In spite of this, they still work on the development of speed. Once a week, for the entire year, sprints over 30m or more, are performed, the first half with the javelin forward and the second half with the javelin withdrawn. Another important element for the improvement of speed is jumping training. Two to three weekly units are scheduled with 80 to 90 jumps each. From February jumps become more intense. For example, jumps from double-leg takeoffs over 100m hurdles. Tafelmeier has a best mark of 21.50 in the five hops from a three-stride run-up and has reached over 7m in the long jump.

Among strength training exercises, West Germans consider as basic the snatch, jerk, squat, step-up and clean. Wessing and Schreiber prefer the front squats, while Wolfermann used to do parallel squats. The pullover is considered as a specific strength drill. Wessing has a best of 95kg. From October to February strength training is repeated two or three times a week. The number of reps is from 6 to 10 with 4 to 6 sets for 6 to 8 weeks. Then they gradually move to more intense weights: 4 to 6 sets of 3 to 5 reps at about 90%.

During the competition period the intensity is changed. Instead of heavy weights, the German javelin throwers use a system of 6 to 8 reps of 60% to 70% at maximum speed. Heavy implements are used especially from November to the first half of January. The implements used include 1 to 4kg shots thrown once or twice a week. Wessing's personal record with the 4kg shot standing throw is 28 meters. Medicine balls, weighing from 2 to 5kg, are thrown up to four times a week. This is alternated with single throws of a heavy javelin or shot, followed by two double-arm throws of a medicine ball.

In October and November the Soviet javelin throwers use ancillary implements. This includes two or three times a week the use of axes, employing 300 to 400 chopping movements with one or both hands. The axe weighs no more than 2 ½ kg and has a 100cm long handle. The other exercises include mainly medicine ball throws from different positions.

In Hungary strength training is carried out with the use of pyramids. They usually perform 6 to 7 sets increasing and decreasing the load. They basically use a reduced load with a high frequency of movements.

In the Soviet Union javelin throwers follow the periodization concepts used by hammer throwers, but there are some differences. Since a great number of throws is considered dangerous to the elbow, they begin to throw later. They usually start in January, but all-out efforts are employed only as from May. Throwing outdoors, that begins in January, takes place three times a week and, whereas the hammer throwers can throw after a weight training session, javelin exponents cannot because of injury dangers.

From January one handed throws are included. In February they use the standard javelin, in March a heavy bar (pole) up to 1.1 kg in weight. In April the 700g javelin, in May the standard and the women's javelin. Soviet throwers avoid the practice of throwing different weighted javelins in the same session because it hinders the rhythm of the action. They prefer to throw only the 600g javelin for two or three weeks in order to avoid the formation of a stereotyped action. Just as sprinters use downhill sprints for breaking the speed barrier, top throwers use light javelins for breaking the specific throwing speed barrier.

In Italy training to build up overall strength begins with the execution of a limited number of what are called fundamental exercises, including the bench press, squat and similar lifts. We prefer to begin strength training with a large number of "complementary" exercises that are gradually reduced so as to move on to the fundamental exercises. We train all muscular groups, including those not directly recruited in the throwing action itself, with a large number of repetitions. The fundamental exercises are compound drills; they require the participation of several groups of muscles. For instance, in the bench press the pectorals, frontal deltoids and triceps. We feel that to obtain better performance in these basic exercises, it is necessary to start with complementary exercises, which are isolation drills. After switching over to the fundamental exercises, all the individual muscle groups that take part in these movements are already sufficiently strengthened and thus able to make a greater contribution to the economy of the compound movement.

As the Soviets do, we in Italy have a winter outdoor national championship, preceded by a couple of other outdoor competitions for the discus, hammer and javelin throw. This allows us to follow the new cycling method in which technical work is pursued all year long. I have divided the preparation into two-month cycles. During each cycle the percentage of general, specific and technical preparation is gradually changed, according to the principle of "qualitative gradualness". The sequence of dominant elements have been scheduled as: general — specific — transformation — competition.