

TRAINING OF THE ELITE FEMALE SHOT PUTTER

By Jaroslav Smid, Czechoslovakia

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Before I begin my paper, I would like to introduce myself. My name is Jaroslav Smid. I am 52 years old. My job is professional coach in the elite centre at Ostrava, where I train, or have trained, the following male and female shot putters:

- **Helena Fibingerova**
- **Cyza Valent** (bronze medal in world championships — 5th place in the 1986 European championships; personal best 69.70 m in 1985)
- **Joseph Silhavy** (personal best 64.90 m in 1976)
- **Zdena Silhava** (shot 19.41 - 21.05 - later discus 74.56 m) (no longer under me)
- **Jiri Chamrad** (hammer 75.98 m in 1981)
- **Alena Vitoulova** (shot 18.78 in 1986)
- **Elena Burgarova** (javelin 65.56 m in 1983)

and a number of other Czechoslovak representatives and record holders in all categories.

At this conference I shall expound on long-term training of world-level female shot putters.

As my example I shall take the training of Helena Fibingerova, holder of sixteen medals: world championship, European championship, Olympic Games, Indoor European championship, ex-world record holder and holder of the best indoor performance; I have been training her for 19 years. So I think I can talk objectively and precisely about everything concerning her training since her first tentative efforts (11m) up to her world records, which doubled her early distance.

I have been able to test my system in the training of other male and female throwers whom I coach or have coached, and who have also reached performances which are extraordinary, even in the high standard of contemporary athletics.

As for myself, I have represented the Czechoslovak Socialist Republic in shot putting between 1955 and 1972. In 1966 I held the Czechoslovak record with a throw of 18.63 m (personal best 18.84 in 1969).

I would like to enumerate the results of Helena Fibingerova and mention her ability to maintain her form over a period of several years, at an excellent level ever since 1972 when she was 7th in the Munich Olympic Games, right up to 1986 when she failed to reach her expected place in the indoor championships owing to a complicated illness and an injury.

In doing so, I would like to show that her training was conducted and is being conducted in a way that enables her to maintain this level of performance over several years.

The basis for obtaining this high level of performance is due to general diversification in training; a fine physical status attained by training and a high level in personal qualities of will-power. These moral qualities and will power are, in my opinion, a factor determining her high level of performance.

I shall not speak here of things that are well known, like the morphological selection that is indispensable to each discipline. Such is evident to all.

To start, I would like to underline that the moral will-power qualities are those that constitute the decisive factor, in attaining a high level in shot putting. This is because many years of hard work are necessary; and the number of suitable candidates diminishes all the time, especially among women in the modern world with its easy life and exaggerated technology. We tend to find suitable people more often in the villages where youth is accustomed to have intense physical work than town youth.

Of course, young village people are better adapted to work and fatigue. In Czechoslovakia all the elite throwers, with the exception of Vasickova (shot putter 19.70 m) have originally come from the rural areas or from a small town.

Another conclusion I have made from my thirty years of practice is the following. Women who decide to take up throwing training are more aware of the difficulties and, in most cases, are harder on themselves than are the men. Accepting this fact, I have not had substantial differences between men and women in my training system.

Apart from certain restrictions, I respect, for example, the monthly female cycle and certain peculiarities for which women cannot do the same exercises as men, without risking injury.

As far as intensity is concerned, I make no distinction at all between the sexes. I shall therefore talk of training female elite shot putters. One must assume that they have already followed years of intensive training and possess qualities in terms of will power and moral application, and an appropriate technique.

- a. physical
- b. technical
- c. psychological
- d. regenerative.

All these components are of the same importance, and that is why we develop them continually; that means specifically that we augment or reduce the volume and the intensity in all the components over the training year, simultaneously or only with small differences.

If I develop those throwers oriented technically, I increase the following:

- the number of general exercises
- the tonnage
- the distances run in sprinting
- the number of throws with different pieces of equipment
- the length and quality of regeneration.

Of course, if the situation warrants it, more important modifications can be made. By that I avoid formation of a substantial disproportion between components developed or between groups of particular muscles. This prevents any break in coordination, without establishing integration in the shot putting activity.

If one does not respect this principle, what happens (and this once happened to me) is the following:

Without having developed anything more than strength for a fairly long time, and without having done specific training in throwing and teaching technique, a disproportional development occurs of the groups of muscles in question, and this causes a breakdown in coordination.

In this case the result is difficult to eliminate, and this inevitably is to the detriment of developing another component, disturbing systematic training.

Having received, as the conference theme, the training of elite female throwers, I am interested primarily in physical preparation. I shall not mention psychological training or developing technique except peripherally, in relation to the two initial components of physical development.

PHYSICAL PREPARATION

I should mention harmonious development of such qualities as strength, speed, special endurance, motor functions and combinations of these elements.

Strength

Strength is the basis also of all other motor qualities, like speed, elasticity, endurance and fitness. In as much as throwers use in particular an explosive strength (fast, dynamic) in their discipline, they also develop other types of strength through different methods which affect their maximum development. The progression of strength should therefore be multi-directional. We develop:

- maximum (absolute) strength
- all round (general)
- special (in our case — explosive)
- hypertrophic
- endurance.

And for this development we use the corresponding training methods.

If the apex of the pyramid is an explosive execution, and the base of the pyramid represents development of maximum strength and training experience, the centre is made up of forms of special explosive muscular exercises with dumbbells, weights, body weight, strength work with different equipment, throws with different pieces of equipment and different weights, etc.

For the different forms of developing strength mentioned above we use a number of technical devices:

- strength work with dumbbells
- strength equipment (gym)
- throwing objects of different weight.

METHOD	MAIN EFFECT					
	A	B	C	D	E	F
1. Weightlifting	X					X
2. repetitive work: body-building	X		X	X	X	
3. speed		X			X	
4. contrast - 110-50 %		X				X
5. Isometrics	X				X	
6. Intermediary - maintained positions	X		X			
7. Excentric 120-160 %	X					X
8. Isokinetics gym.		X				X
9. Plyometrics Rebounding Balance		X				X
10. endurance			X		X	

- A. Absolute strength
- B. Special strength (explosive, dynamic)
- C. Endurance strength
- D. Hypertrophy
- E. Useful for young people and starters
- F. For accentuated specificity practised by mature athletes.

By a combination of these procedures one can attain truly efficient results in developing all types of strength.

Maximum strength (absolute): more often using weights with which we can determine maximum performance precisely. The development of maximum strength, apart from the sheer benefit of gaining maximum strength also increases self confidence. We do that before the competition period, usually on a Monday, after the rest day, when the athlete's organism is capable of truly attaining the maximum, avoiding the risk of fatigue and therefore of injury. With maximum weight we use 8 sets with 1 or 2 repetitions. Of course, we develop these progressively through sets 3 or 4, starting with 70 %. I normally suggest 3 exercises with maximum effort in a training session:

All round (general) strength: we should develop all the muscle groups and particular these muscles which are not immediately involved in the activity, since the discipline (shot putting) does not require them or since they are only involved partially as support or synergists. This method is necessary to develop the

organism harmoniously, to improve the general physical condition and to maintain strength in those essential muscle groups which must not be permitted to lose high muscle tone.

The choice of exercises is very varied; in the three initial cycles of the year we devote ourselves to increasing the development of general strength, with less importance in the following cycles. The insertion of 2 to 3 exercises of this nature is most frequently done on Friday afternoon. We do these exercises with weights 60- 80 % of the maximum weight, and the number of repetitions is from 36 to 48 in one series.

Special strength (explosive, dynamic): this is a form of strength which manifests itself most in our discipline and that is why we devote great attention and maximum effort to it. As far as ways and means are concerned, they are extremely varied.

For its development we use exercises with weights, equipment (with the weight of the body itself), throwing objects of different weight, multiple forms of jumping.

In principle, this method should bring the desired effect, that is to say acquisition of an ability to throw the implement as quickly as possible (speed being increased by degrees). Execution in multiple sets is not possible since long intervals are necessary to conserve maximum efforts.

Consequently, these exercises may be done in different training sessions. We carry out these exercises every day. They are done preferably and almost always after training that does not tire the athlete. This permits her to produce efforts from sub-maximum to maximum. In the event of training being in two parts, the exercises are put at the beginning of the second phase.

The forms of developing this strength are quite numerous. Exercises with weights and apparatus should develop the same muscle groups which govern the discipline being considered, without neglecting coordination. The special explosive exercises using dumbbells and apparatus are done every Monday afternoon (in the second part), Wednesday in the two phases (morning and afternoon) and on Friday afternoon (a single exercise).

During the other days (Tuesday, Thursday, Saturday), we develop this form of strength using the following forms:

- throwing weights with the hands
- small dumbbells
- various jumps with the legs, arms
- strength work through body weight.

We do the exercises with weights and apparatus at a percentage of between 60 and 80% , with the number of repetitions from 5 to 3 in each series, with maximum effort (speed). The subjective feeling of the athlete determines the duration of intervals between the various attempts (when the athlete feels that he is capable of doing the exercise to maximum capacity). The total number of repetitions varies from 25 to 35, according to the period and the type of exercise.

Throwing different objects is done in different ways but competitively at least twice a week. This should guarantee maximum effort. To preserve this intensity, 25 to 70 throws a day should be enough, but more than 40 throws cannot be done in succession, and one needs to introduce a supplementary session in the afternoon.

Different forms of jump are possible (plyometric strength work), in introducing weights, repetition and height of jump.

Swing weights enable the athlete to exercise the arms, the movements consisting of projecting the load which oscillates and on swing back the athlete cushions the return then projects the load again.

By strength work with the aid of body weight we have in mind:

- various forms of jumping
- vaulting with gymnastic equipment
- jumping up a slope, stairs, etc.

All the exercises mentioned respect the principles stated above.

Method of repeated efforts (body-building): we resort to this method to construct muscle mass and, as a priority, in the first preparatory period up to January, and again at the end of the indoor season up to April. For this form of strength we not only employ exercises with weights and apparatus, but also exercises using body weight. Particular exercises, especially with body weight, are inserted at the end of training sessions on Tuesday, Thursday and Saturday. With weights and apparatus, on Friday, in the second phase — that is in the afternoon. The load is from 60 to 70 % (maximum number of repetitions from 8 to 10 in one series — number of series 5 to 6, short intervals).

My experience has persuaded me not to constantly use body-building methods where the number of repetitions and series are high, because this method loads to the loss of elasticity of the muscles, the loss of speed and other negative phenomena. We do not, then, use it completely.

I know many athletes who would like to attain maximum results in their discipline, especially by this method and the method of developing maximum strength. Their performances with weights were phenomenal (bench press 260-300 kg, squats 300-340 kg, and so on), but they can only do a standing long jump of 2.30 m and their performance in shot putting, does not correspond to their strength parameters. With this I want to draw attention to the risks engendered by too big a development of muscular strength and acquisition of maximum strength. We should develop it in a sensible way and always only to the level where we are capable of using it optimally for the needs of our discipline. Anything in excess of that is not merely useless, it is harmful. Unfortunately, many throwers are directly attracted by this method, which may be explained partly by its convenience, and partly by giving the impression of a strong physique (and being strong). For me the ideal thrower is the Swiss Guenthor who looks like a decathlete.

Endurance strength

We no longer develop this strength in its pure form, since we automatically diminish the effect of developing other types of strength. As far as we are concerned, it is by the successive training sessions that one acquires this strength, which is characterized by the ability to control intensive training and quality work over the long term.

The combination and progressive graduation of efforts by all the cited methods produce an adaptation of the organism to fatigue, as long as the thrower is able to endure very high training loads, while still being able to apply maximum effort on the following day.

This training enables the thrower (or, specifically, a female thrower like Fibingerova) to achieve a top performance after only a short 'tapering' (rapid acquisition of form) and to participate in numerous competitions close together without great variation in performance.

Articular motor function (relaxation range of movement):

This area is one of the most neglected. Male and female throwers do not seek to do exercises which hurt them and do not bring an immediate effect in form or results.

We develop range of movement from the outset, and I may say that while Fibingerova may seem at first sight clumsy, she has excellent mobility in relation to her proportions. This is one of the reasons why she has been among the best shot putters in the world for so long.

This is necessary, for with age and under the influence of strength work and the adding of muscular mass, motor functions and movement range may steadily diminish; the development of this ability is, therefore, particularly important. This

Morning (1 phase)	
Mon	Warming up Shot: technique 25 × (3.5 + 5 kg weight) Strength work 70-95 % (100 %) 3-4 exercises with 25-30 repetitions
Tues	Heavier weights (6-7.25 kg) without glide + simulated throws 30 + 30 + 30 Preparation - sprint 300-450 m Throwing implements 6-10 kg 30-40 Jumps (preparing for thrust) 50-70
Wed	Weight 3.5 + 5 25 × Explosive strength work — weights, apparatus 70-85 % (90 %) 3-4 exercises 25-30 as Monday afternoon
Thurs	Weights heavier (6-7.25) glide only + simulated throws - 30 + 30 + 30 Preparation of sprint 300-400 m Preparation of thrust 50-60
Fri	Weight 3.5 + 5 - 25 Explosive strength work - 1 exercise 25-35 implement 70-85 % 3 body-building exercises 36-48 reps. to 8-10, weight 60-80 % (short intervals)
Sat	Throws 40, distance from 60 m to 600 m, jumps slope, stairs 70-100 Strength work for trunk, etc. by body weight 160-240 repetitions
Afternoon (2nd phase)	
Mon	Weight 4 kg technique — 25 × Explosive strength work — apparatus (gym) Weights - weight 70-85 % 3-4 exercises with 25-35 repetitions (5-3) Regeneration
Tues	Throws 30, balances, 40-80 (legs), jumps with arms (plyometric strength) 40-60 Strength work for trunk, etc. by body weight 120-200 repet. Regeneration
Wed	Weight 4 kg - 25 Explosive strength work - 3 exercises 30-35 Games Regeneration
Thurs	Throws 30, balances 40-50 (legs) Jump with arms 40-50, strength work for trunk, etc., by own body weight 120-180 reps. Regeneration
Fri	Weight 4 kg - 25 General strength 3 exercises 60-80 % max reps 36-48 at 6-8 Regeneration
Sat	Games, fartlek

is what facilitates a longer action on the shot, a relaxed movement and a better coordination. Most throwers who orient themselves on developing strength by body-building and by the maximalist method and who neglect at the same time the increase, or at least the conservation of a sufficient range of movement, thereby limit their results and bring about a premature end to their careers.

Speed

We should develop sprinting, in so far as the notion of 'speed' is concerned with rapidity of all movements and of all motor actions. Sprinting and running generally are very often neglected and misunderstood by throwers — javelin throwers are an exception. Many throwers of elite standard in Czechoslovakia have paid for these mistakes because running is a basic element which must be practiced by all athletes, and not simply by track athletes.

The improvement of blood circulation and of the respiratory apparatus is just one of the numerous reasons why it is essential to insert running into training every day. Good male and female shot putters are aware of the peculiarities of their discipline and achieve excellent results in sprints from 60 m, where they are quite capable of beating specialist runners. For this reason, if they stop including sprinting in their repertoire, this leads to a loss of speed, of elasticity and of fitness. These shortcomings cannot be made up by increasing muscle mass, by weight and age.

I include development of speed in running in the usual preparation three times a week, every two days, over a distance of 30 m, and at the start of the new year, over a distance of 150 m.

The method used to develop sprinting speed are as follows:

- starting from blocks — 30 m
- starting in various positions — 20 m
- standing start — 30 m
- start on gentle slope — 30 m rising
- start on gentle slope — 30 m descending
- combined ascent and descent
- runs concentrating on range and maximum speed
- climbing stairs
- speed throwing over 30 m

- distances of between 100 and 150 m (only in the two first cycles October-November).

These different methods develop not only the quality of speed, but also coordination, range of movement and improvement of form by sprints of 150m. In the period where one uses longer runs, the total distance is from 800 to 1200 m, or indeed more for a training day. We regularly alter the programs in a manner to associate each day of our repertoire of 10 times 20 m and of 6 times 30 m, with maximum range and speed. On Saturday we employ other forms, especially climbing stairs and running up hill over 60 m. To complete it, I would like to say that the best performance of Helena over 20 m in February 1986 (she was 37 then) was 3 seconds 42 (manual time); in summertime she is quicker, but this summer, owing to injury, she was unable to run at maximum. In the pre-competitive period, the total distance is reduced. We use distances of 20 m, and 30 m on Saturdays. The competition period necessitates a reduction in the total distance and intensity: 150 to 250 m, according to the length and importance of the competition.

PSYCHOLOGICAL PREPARATION

Psychological preparation develops in step with physical preparation. A good physical condition should favor self-confidence and psychological resistance; I deliberately say 'should' since it is not always the case. In fact, some athletes who are very well trained and who have attained excellent results in training and when taking tests, can lose their confidence the moment they take part in competition and their performance goes out the window. I do not wish here to analyze the causes of such problems. They are diverse and therefore the manner of avoiding them will be equally diverse. During my long activity in preparation, I have met such athletes and, among others, Helena Fibingerova who has not always been what she is today.

We have collaborated with a number of psychologists, and thanks to that I have become certain that it is the personal trainer of the athlete who must be his or her psychologist. With all of the respect that I owe to professional psychologists, I dare to say that they cannot know the whole of the problem of preparation. They could know all the problems only if they took part in competitions in the given discipline. Other than that they would have to take part in the athlete's training every day, and know him or her perfectly. This is not possible, unfortunately. It is the coach's duty to acquire as many theoretical aspects as possible in the area of psychology and to make his knowledge available to athletes with whom he works. As a consequence it is desirable for athletes themselves to have some acquaintance with psychology and for them to be able to resolve the problems that crop up themselves.

Most athletes are dominant persons and they do not like to be directly controlled, so it is important for them to see the need for direction from the coach. One

solution to these problems, although it is difficult for many coaches to admit it, is the participation of athletes in the creation of their own training plan, or directly for the athlete to have the chance to elaborate his or her own plan. If the coach detects these aptitudes and that the athletes themselves will adhere completely to this concept, the coach's function is by no means devalued.

Of course, mature athletes are bound to know practically all there is to know about preparation which they have modified according to their own impressions experienced over the years under the direction of their coaches.

Thus, the coach functions as a consultant. In technical preparation, with the use of video, the situation is similar; analysis is by a common consultation. Thus, the athlete acquires the best feeling of assurance and responsibility.

At present we have many cycles for our long-term preparation. There is first and foremost the cycle of four years when we plan one Olympics or another. In this four-year period we plan performance targets and forecast loads, in particular training indices. An integral part of this Olympic cycle is the annual cycle divided into thirteen cycles of four weeks. Accordingly, I cite a concrete plan. In a cycle of four weeks, as a function of the training methods being used and the specific requirements of the weeks; we evaluate the total training analyzed by computer in the elite athletics laboratory.

I determine the specific distribution of training for each week from Monday to Saturday. Since it is not necessary to react to the momentary state of the athlete in regard to training conditions and several other factors, it is not desirable to elaborate distribution for particular periods (preparatory periods, winter competitive periods, 2nd preparatory period) on which I rely in creating the weekly plan. At present Helena Fibingerova works to the system presented in Appendix 1.

As the season approaches the system undergoes modifications in certain areas, the load thus fluctuates as well as the number of throws.

On the other hand, quality rises and adaptation is a permanent rule.

This is one approach to training in the case of a female shot putter: world champion Helena Fibingerova.