

ORIGINAL RESEARCH

COMPARATIVE ANALYSIS OF THE REPS NUMBER WITHIN TWO TRAINING MACRO-
CYCLES OF THE WEIGHTLIFTING OLYMPIC TEAM

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Abstract

The authors present a comparative analysis of the number of repetitions in two training macro-cycles of the weightlifting Olympic team. We have considered that the differences between the number of reps in each training stage of the macro-cycles no. 1 and 2 will influence the performances achieved in competition. This approach has led to the organization of a study group in the weightlifting Olympic team of Romania.

The scientific argument is the presentation of the number of reps during the preparation of the weightlifting Olympic team in different mezzo and micro-cycles of training, that, by decreasing the number of reps and increasing the intensity of the effort up to the maximum level from a training micro-cycle to another, contributes to reaching the fitness peak in competitive period within the macro-cycle no.1; also, an optimum number of reps during the training macro-cycle no.2 will make possible to keep the fitness necessary for their turning into good account in the next competition.

The study was conducted over a period of two training macro-cycles (04.01-16.08.2008), with a group of 6 athletes, of 17 to 31 years old, whose target of performance was the participation in the European Championships (E. C.) for Seniors, Lignano – Sabbiadoro, Italy 2008 and the Olympic Games (J.O.) in Beijing in 2008. The athletes' progresses during the training stages and competitions were recorded by means of the statistical-mathematical and plotting methods.

The study highlights the number of reps within two training macro-cycles of the weightlifting Olympic team. At the end of the paper we are able to confirm that the differences between the number of reps at each stage of training in the macro-cycles no. 1 and 2 have influenced the performances achieved in competition.

Key words: fitness, weightlifting, planning, training, performance.

Introduction

The sharp increase in the weightlifting performances, a phenomenon that we are permanently witnessing, is based on the technique and training methods improvement. The modernization of the materials and equipment for training and competition (stage, platform, podium, barbells, arbitration and display equipment, computer programs for competitions conducting) have imposed the emancipation and selection of the lifting styles, of the arbitration regulations and resulted in the increased performance and spectacular character of this sports branch (News Bulletin, Romanian Federation of Weightlifting, 2009).

A high-level performance is the result of years of intense training, methodical and well planned. All along this period, the athlete tries to adapt his body functions to the specific requirements of the sport he had chosen. The adaptation level is reflected in the performance capacities. Higher the degree of adaptation, better the performance (Bompa T., 2002).

The training plan requires a detailed elaboration of the performance and training objectives, of the competitive calendar, of the methods and means used, of the requirements within the training sessions, the micro and mezzo-structures, volume and intensity of the effort, elaboration that is not rigidly, mechanically performed, but taking into consideration how the athlete responds to requests (Teodorescu S., 2009).

For the creation of some efficient strength training programs, the coaches and athletes use two variables of training: volume and intensity. The volume and intensity change depending on the competition program and the training target (Bompa T., Carrera C.M., 2006). As a first component of training, volume is the quantitative prerequisite for achievements of high technical, tactical and physical level. As an athlete is able to achieve high levels of performance, the total volume of training becomes more and more important (Muraru A., 2008).

The improvement of the functional capacity of the body allows the making of the same type of effort, but much more economical. Therefore, new relations are created between the body possibilities and the

stimulants intensity. The avoidance of the appearance of the habitude or adaptation phenomenon is a prerequisite to improve the body submitted to the effort (Nicu A., 1993).

The main **purpose** of this paper is to highlight the number of reps for the training of the weightlifting Olympic team for the European Championships for Seniors and the Olympic Games.

Hypothesis of the paper. We believe that the differences between the number of reps at each stage of training within the macro-cycles 1 and 2 will influence the performances achieved in competition.

Research methods used:

- Method of bibliographic study;
- Method of experimental study;
- Method of observation;
- Statistical-mathematical („KyPlot” program - linear correlation test) and plotting method.

Research organizing and carrying out

In order to highlight the number of reps in different mezzo and micro-cycles of training we have conducted a study within the weightlifting Olympic team of Romania.

The study was conducted over a period of two training macro-cycles (04.01-16.08.2008), with a group of 6 athletes, aged from 17 to 31, whose performance target is the participation in the European Championships for Seniors (E.C.), Lignano – Sabbiadoro, Italy 2008 and the Olympic Games (J.O.) of Beijing 2008.

Period and place of training:

I. Macro-cycle no.1:

1. Training period:
 - 04.01 - 24.02.2008 – Bucharest;
 - 19.02-23.02 – verification at National Championships for Seniors round Bucharest;
 - 24.02-16.03.2008 – Forban.
2. Competitive period:
 - 17.03-13.04.2008 – Bucharest;
 - 14.04.20.04.2008 – European Championships for Seniors, Italy.

II. Macro-cycle no.2

1. Training period:
 - 21.04-25.05. 2008 - Bucharest;
 - 26.05- 15.06.2008 – Forban;
 - 16.06-13.07.2008 – Poiana Braşov;
2. Competitive period:
 - 14.07 -02.08.2008 – Bucharest;
 - 03.08-16.08 – Beijing, China.

As shown above, the periods and places of training are Bucharest, Forban and Poiana Braşov, but an adequate training room exists only in Bucharest at the present moment.

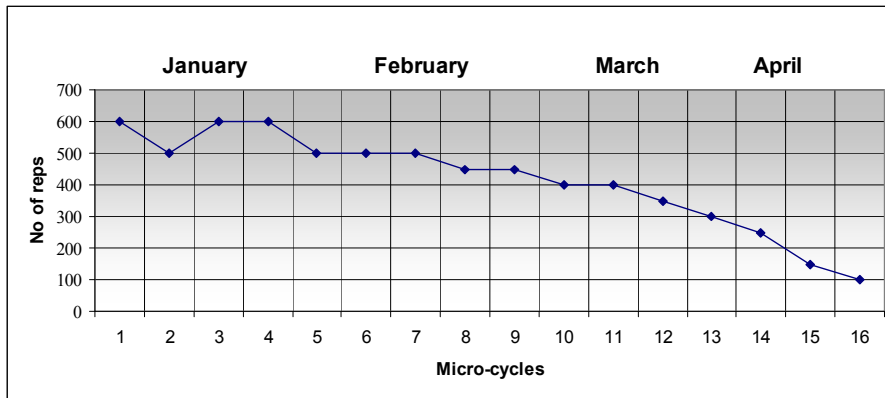
We will not insist on the training volume and intensities, but will highlight the number of reps in each training micro-cycle within the macro-cycles no. 1 and 2; these ones were planned per 62 kg, 69 kg, 77 kg weight classes (see tables and graphs).

Results of the study

Table no.1. *Distribution and number of reps per mezzo and micro-cycles of training for the European Championships Lignano – Sabbiadoro, Italy 2008*

Month Mezzo-cycle	Competitions Calendar	Seniors	Micro-cycle- no. of reps					Total reps
			1	2	3	4	5	
January			600	500	600	600	500	2800
February			500	500	450	450	-	1900
March			400	400	350	300	-	1450
April	European Championships	Seniors	250	150	100	400	450	1350
								7500

Note: the number of reps during the micro-cycles no. 4 and 5 of April will be added to the number of reps of the macro-cycle no.2 for the Olympic Games (J.O.) of Beijing. So, the number of reps within the macro-cycle 1 will be of $(7500 - 850) = 6650$ of reps.

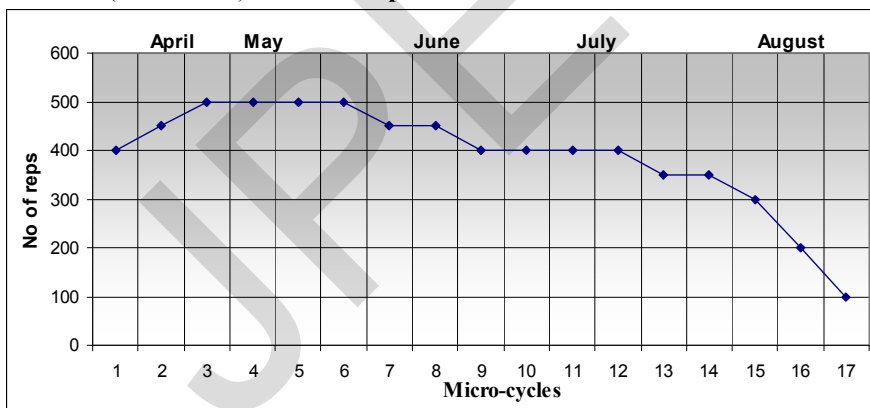


Graph no.1. Number of reps per mezzo and micro-cycles of training for the European Championship of Lignano – Sabbadoro, Italy 2008

Table no.2. Distribution of reps number per training mezzo and micro-cycles for the Olympic Games - Beijing, China 2008

Month Mezzo-cycle	Competitions Calendar	Seniors	Micro-cycle- no. of reps					Total reps
			1	2	3	4	5	
May			500	500	500	500	-	2000
June			450	450	400	400	-	1700
July			400	400	350	350	300	1800
August	Olympic Games	Seniors	200	100	-	-	-	300
								5800

Note: the number of reps during the micro-cycles no.4 and 5 of April will be added to the number of reps of the macro-cycle no.2 for the Olympic Games (J.O.) of Beijing. Therefore, the number of reps during the macro-cycle 2 will be of $(5800 + 850) = 6650$ of reps.



Graph no.2. Number of reps per training mezzo and micro-cycles for the Olympic Games - Beijing, China 2008

Table no.3. Results of the performances achieved at the E. C. Italy 2008

Full name	Birth year	Weight class	Snatch	Clean and jerk	Total	Ranking
Roșu Alexandru	1987	69	137	170	307	VI
Martin Răzvan	1991	69	125	155	280	XIX
Dogariu Sebastian	1977	77	147	180	327	VII
Biro Laszlo	1981	77	145	-	-	-

Table no.4. Results of the performances achieved at the Olympic Games (J.O.) Beijing 2008

Full name	Birth year	Weight class	Snatch	Clean and jerk	Total	Ranking
Buci Antonio	1990	62	130	165	295	IV
Martin Răzvan	1991	69	130	158	288	XIX
Roșu Alexandru	1987	69	136	-	-	-
Rusu Răzvan	1988	77	140	170	310	XVIII

Table no.5. Correlation of the reps number between the reps number of macro-cycle 1 and 2

Training for European Championship Italy 2008	Macro-cycle no. 1				
	Micro-cycles				
	1	2	3	4	5
r-0.96 t- 5.25 P<=0.05	r-0.98 t- 9.68 P<=0.05	r-0.97 t-6.27 P<=0.05	r-0.46 t-0.47 N.S. >0.05	r- 0.57 t-0.99 N.S. P>0.05	
Training for Olympic Games Beijing 2008	Macro-cycle no. 2				
	Micro-cycles				
	1	2	3	4	5

Interpretation of the study results

The training schedule of the Olympic team included two macro-cycles that were carried out successively, namely:

Macro-cycle no.1 (04.01.2008 – 20.04.2008) is formed of two periods, as follows: 105 days of training, **6650** of reps (table no.1).

- *The preparatory period*, from 04.01 to 16.03.2008, totalizes **70** days, 11 micro-cycles, during which are intended **4433** of reps. During the micro-cycle no.8 (18-23.02.2008) the Finals of the National Championships for Seniors, round stage - qualifications and the Cup of Romania for Seniors took place at Bucharest; these competitions offered an occasion to verify the athletes of the Olympic team.

- *The competitive period*, from 17.03 to 20.04.2008, totalizes **35** days, 5 micro-cycles in which are planned **2217** of reps; this period is finalized in the European Championship for Seniors (Italy, Lignano - Sabbiadoro 14-20.04.2008).

Macro-cycle no.2 – the short period of time until the Olympic Games does not allow a relaxation after the European Championships for Seniors, therefore the annual macro-cycle no.2 starts immediately, as follows: **118** training days, **6650** of reps (table no.2).

- *preparatory period* (21.04-13.07.2008): it is formed of **84** days, 12 micro-cycles, in which are scheduled **4733** of reps;

- *competitive period* (14.07-16.08.2008): it is formed of **34** days, 5 micro-cycles, totalizing **1917** of reps and finalized in the Olympic Games of Beijing.

In tables no. 3 and 4 are shown the results obtained in competition during the European Championships for Seniors Italy 2008 and the Olympic Games of Beijing 2008 of the Olympic team weightlifters. Out of the training team for the E.C. Italy 2008 only two athletes (Roșu Alexandru and Martin Răzvan) participated in the Olympic Games also, the other athletes were replaced by younger ones to whom was given the chance to distinguish themselves in competition. An analysis of the reps number in the training micro-cycles within the macro-cycles 1 and 2 makes obvious significant differences between the micro-cycles 1, 2 and 3 at $P \leq 0.05$ and insignificant differences between the micro-cycles 4 and 5 at $P > 0.05$.

Conclusions

The equal number of reps during both training macro-cycles shows the number of micro-cycles within the training mezzo-cycles, the training days and the number of reps in each micro-cycle. The decrease in the number of reps and the increase of the effort intensity up to the maximum level from a training micro-cycle to another contributes to the reaching of the peak fitness during the competitive period within the macro-cycle no.1. Ensuring an optimum number of repetitions in the training macro-cycle No.2 helps to maintain the fitness needed to their turning into good account during the next contest. The equal number of reps at both training macro-cycles has led to the achievement of different performances in competitions. The insignificant differences between the training macro-cycles at the micro-cycles 4 and 5 highlight the specific character of the training depending on the competitive calendar. In the end we can confirm that the differences between the number of reps at each training stage of macro-cycles no. 1 and 2 have influenced the performances achieved in competition.

References

1. Bompa T., *Theory and Methodology of Training. Periodization*. EX PONTO Publishing House, CNFPA, Bucharest, 2002 (11).
2. Bompa T., Carrera C.M., *Periodization of Sport Training*. TANA Publishing House, Mușătești, 2006 (69)
3. News Bulletin (N.B.), Romanian Federation of Weightlifting, 2009, no.55.
4. Muraru A., *Coach Manual and Methodology of Training. Collection of Lessons*. EX PONTO Publishing House, CNFPA, Bucharest, 2008 (251).
5. Nicu A., *Modern Sport Training*. EDITIS Publishing House, Bucharest, 1993 (113)
6. Teodorescu S., *Periodization and Planning in Performance Sport*. ALPHA MDM Publishing House, Bucharest, 2009 (108).