

The 5th European Pole Vault and High Jump Conference

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27:3; 61-66, 2012

Cologne, Germany

Introduction

The 5th edition of the European Pole Vault and High Jump Conference, hosted by the German Sport University Cologne, brought together a strong line-up of internationally recognised coaches, scientists, star athletes and a record 283 participants from 24 countries under the theme “Physical Preparation” from 16-18 March 2012.

Staged with support from the German athletics federation (DLV) and Nordic Sport, this edition of the biennial conference was the first event in the 2012 European Athletics Coaching Summit Series. Plenary sessions took place in the main lecture theatre of the university and the practical demonstration sessions were staged in the university’s large, fully equipped athletic hall.

Former German national pole vault champion Günther Lohre, who is currently a DLV vice president, welcomed the participants at the opening of the conference. In his speech, he emphasised the value of information exchange amongst coaches, scientists and athletes for the further development of performances in athletics and the need to build and strengthen international communities for this purpose. Mr Lohre was immediately followed by the holder of the German women’s outdoor high jump record (2.06m) and 2009 European indoor champion Ariane Friedrich, who gave an overview of her exciting career with all its ups and downs, including her achilles tendon rupture in late 2010, and insights into her training programme.



The main conference programme included a mixture of general experiences, lectures on event specific theory, practical presentations, guided observation sessions, roundtable discussions plus informal opportunities for the participants to interact directly with the speakers.

This report provides highlights of the presentations and other activities that took place during the four session of the conference.

Session I – Friday Afternoon

The first of the main presentations, entitled “Periodisation for Throwers – A Relevant Model for Jumpers?”, was given by world and European championships silver medallist in the pole vault, Martina Strutz (GER) and Thomas Schuldt. Ms Strutz, who was successful on the European level between 2005 and 2008, developed severe problems due to weight gain and Achilles tendonitis and had to spend time in the hospital in 2009. The following year, she returned to her former coach, Mr Schuldt, better known as a high-performance throws

coach, who put her on a training programme that was derived directly from the philosophy of the successful German throwing school and contained four basic steps: 1) general conditioning, 2) maximum power, 3) specific power and 4) technique training. She concentrated on developing ever more strength and speed and then on using stiffer poles but no higher grip. At the same time, she lost more than 4kg of body weight. Sharing overall training structure, key microcycles and individual sessions, Strutz and Schuldt made it clear that being an outstanding technician, as Ms Strutz was before 2008, was an important prerequisite for their strategy. M. Strutz was not able to improve her pole vault results in 2010, but her basic body composition improved and she mostly got rid of her various injuries. In 2011, she returned to the international scene with great results, winning a silver medal at the IAAF World Championships in Athletics with a national record of 4.80m and became more consistent in competition (10 times 4.70m or higher).

In one of the four parallel workshops that followed, German national coach Wolfgang Killing suggested that the training philosophy

presented by Schuldt and Strutz could be used by all jumpers. Starting with strength endurance without jumping or sprinting is a means to get fitter and lowers the danger of injuries to the legs and feet. A higher level of strength endurance is a good basis for improving the maximum power, which itself is a good platform for bounding and sprint training needed for improving specific speed and power. This means the athlete can do the technical work on a higher level. And to apply these different sets of training means one after the other gives different stimuli to the muscles, optimises adaptation and creates a good chance to improve performance.

Session II - Saturday Morning

In the day's first presentation, entitled "Strength Training in the Long-term Training Process", Klaus Wirth from the Institute of Sport Sciences at the J.W. Goethe University in Frankfurt, covered the importance of maximum power for the jumping events and speed power in general. Referring to several research reports, Dr Wirth showed the relevance of maximum power and weight lifting exercises,



including the deep-squat. He then explained the classic training schedule for developing power, starting with hypertrophic training (high number of repetitions, endurance power), changing to maximum weight training (1-3 repetitions with high loads, maximum power), then changing training again to a regime focused on reactive/specific power, bounding and technical work before the competition period.

The second presentation of the morning, entitled "Mechanisms of Adaptation of Muscle Cells/Fibres to (resistance-) Exercise - Implications for Training", was given by Wilhelm Bloch, the head of the Institute of Cardiology and Sports Medicine at the German Sport University Cologne. Prof. Bloch gave a deep insight into mechanisms of adaptation of muscle cells/fibres to exercise and named some implications for training. He also explained that muscle plasticity is higher and faster than expected and thus offers good chances for optimising adaptations through training. Periodical changes of intensity and volume guarantee both hyperplasia and hypertrophy. As adaptation of muscle cells is very specific, even technical modifications alter the regulation of muscle structure and function.

Session III – Saturday Afternoon

As has been the case for the last three editions of the conference, the Saturday afternoon session saw the group divide into two parallel mini-conferences, one for high jump and one for pole vault. The high jump mini-conference, moderated by German national coach Wolfgang Killing, featured the following presentations and practical demonstrations:

The Norwegian Training Regime

Hanne Haugland (NOR)

Ms Haugland, the 1995 world high jump champion, said that there are different ways to success in the high jump, and that each athlete has to find out his/her own right way. She introduced the Norwegian high jump system using a model one-year plan. The main training contents are weight training (good technique, from

light to heavy to fast), bounding and plyometric jumps, sprints (from 150m easy to short, high intensive sprints/hurdles) and technical jumps (short approach to long approach).

The British Training Regime

Fuzz Ahmed (GBR)

Mr Ahmed is the national event coach for high jump in Great Britain. He explained the major changes in UK athletics after London was awarded the 2012 Olympic Games in 2007. These included changes in the coaching structure, the people involved, coaches' education programmes and in training design. He then gave an overview of the training structure for high jumpers in the Olympic season.

The German Training Regime

Brigitte Kurschilgen (GER)

Ms Kurschilgen is the national event coach for high jump in Germany and responsible for both men and women. She illustrated the very individual planning of the 2012 season for Germany's top high jumpers and explained the specific challenge that came up with having the European Championships six weeks prior to the finals at the Olympic Games in London.

Practical Demonstration

Hanne Haugland (NOR) and Fuzz Ahmed (GBR)

In the second half of the afternoon's programme, Ms Haugland and Mr Ahmed gave a very exciting practical coaching demonstration working with German junior high jumpers.

The pole vault mini-conference, moderated by German national coach Herbert Czingon, featured the following presentations and roundtable discussion:

My Training Philosophy

Damien Inocencio (FRA)

Mr Inocencio, himself a former pole vaulter with a best of 5.42m, was not a full-time coach when he, started working with Renaud Lavilénie (FRA) in August 2008. At that time, Mr

Lavillenie had already achieved a mark of 5.70m indoors, but failed to qualify for the Olympic Games in Beijing. Mr Inocencio very soon changed aspects of Mr Lavillenie's approach and takeoff: the run-up was moved out from 16 to 20 strides and the take-off spot was moved out from around 4m to between 4.40m and 4.60m. This allowed Mr Lavillenie to take advantage of his speed better than before, use stronger poles with a higher grip and achieve a better bar clearance. He was able to improve to 5.80m, then 5.96m and finally 6.01m. The problem was that he was unstable in training and competition and only could only place third in the IAAF World Championships in Athletics in Berlin the same year, despite being the world performance leader at the time. Mr Inocencio explained the various refinements to the training programme and to his own philosophy that enabled Mr Lavillenie to improve further and eventually take gold in the IAAF World Indoor Championships the week before the conference. He said that expected even further improvements by Mr Lavillenie in the future, including a big performance at the Olympic Games in London.

Biomechanical Aspects of Modern Pole Vault Technique

Falk Schade (GER)

Mr Schade, has been a biomechanics consultant to top German vaulters for over 15 years. In this role, he has compiled hundreds of individual energy analysis tests of high performance pole vaults. He said that we have to abandon the idea of a generalised model of "modern pole vault technique". For instance, the concept of the "free take-off", seen by many athletes and coaches all over the world as a key to top performances, is not supported by the available scientific data. Based on specific training tests with current German pole vaulters, Mr Schade suggests individualised strategies for the short-term and the long-term development of top results. Training programmes have to be considered for how they address aspects of technique specific to the individual vaulter. In particular, the level of the initial energy during technical training and competition very often shows to be a counter productive factor for technical improvement. Mr Schade suggested that, for some athletes,



a short-term reduction of approach speed applied in parallel to an improvement of the fast stretch-shortening cycle of the hip/legs and the arms/shoulders, respectively might be a productive approach.

Long-Term Analysis of Velocity and Take-off Data in the Pole Vault

Bettina Perlt (GER)

Dr. Perlt, the head of the Pole Vault Department at the Institute Of Applied Training Sciences (IAT) in Leipzig, Germany, has collected thousands of individual data sets on vaulters. These show the importance of improved velocity data in combination with proper step rhythm and take-off spots for the successful individual long-term development. She also gave some insight into the computer based "MIS"-System with a structured compilation of velocity, stride length and video data, which she has been programming for more than six years and which is still growing, including data from different independent sources.

Roundtable: State of the Art in Pole Vaulting

Herbert Czington (GER) – Moderator, Damien Inocencio (FRA), Alan Richardson (GBR), Steve Rippon (AUS), Andrei Tivontchik (GER), Jörn Elberding (GER)

The discussion covered various aspects of the current global situation and evolution of performance, technical and training concepts in the pole vault. Among the conclusions reached were that results in the men's pole vault lag behind the results achieved 20 years ago. Identified reasons for this decline were: 1) the collapse of the pole vaulting school in the former USSR, 2) Rule changes to the disadvantage of the athletes (shortening preparation times, shorter bar pegs, the hand rule), 3) increased success of anti-doping efforts. In the women's pole vault, these causes have not stopped rising standards in the still young event. But even here, development seems to have come to a halt among the top ten in the world, while the results between those ranked from 11 to 30 are still improving. Thus, the performance gap between female junior pole vaulters and the global level broadens, leading



to ever more drop outs, even among previous medal winners in global junior competitions. The participants agreed, that the various pole manufacturers' developments of improved poles has not helped to generate better performances yet. The cost of proper poles and pits remains very high in most areas of the world. Improved international cooperation is important to generate better utilisation of individual experience in the development of know-how of technique and training in the pole vault.

Session IV – Sunday Morning

Adaptation of Tendons to Training Loads

Gert-Peter Brüggemann (GER)

Prof. Brüggemann is the head of the Institute of Biomechanics and Orthopaedics at the German Sport University Cologne. He said that the adaptation of tendons to training loads has been subject to a series of studies. After explaining the mechanisms of storing and recoiling energy in the muscle-tendon-unit, he presented findings relevant for the training of jumpers: 1) Tendons have the potential to adapt in both volume and material properties, 2) tendons' response to training is later than that of muscle, 3) tendons of pre-pubescent children have the potential to adapt, 4) tendon adaptation increases the potential of transfer force (load), 5) tendon adaptation increases the potential to store elastic energy and to enable the CE to work at a higher force potential; 6) tendon material properties play an important role in athletic performance.

Summary and Outlook

Herbert Czingon and Wolfgang Killing (GER)

The conference was concluded with a presentation that covered the views of participating athletes, coaches and national coaches. Key words highlighted included: 1) crisis, 2) decision point, 3) responsibility, 4) analysis and 5) hard work. A focus of the discussion was on the first day's presentation about the application of the training used for throwers to the jumping events.

Additional Points

The available Powerpoint presentations are available for download at: <http://www.polevault-symposium.de> in the "news" section.

I would like to thank the German Sport University Cologne, the student volunteers and everyone else involved in the conference for their valuable contributions to its success. Special thanks to Herbert Czingon and Wolfgang Killing for both their work and their contribution to this report.

I would also like to acknowledge the generous support of our sponsors Nordic Sport, the German Athletic Federation (DLV) and European Athletics.

Finally, I would like to inform the readers of this report that the 7th edition of the European Pole Vault Conference will take place in Cologne in 2014.

Reported by Wolfgang Ritzdorf

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