ATHLETICS PROGRAMMES AND PROGRAMMING

OWEN VAN NIEKERK

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By Owen van Niekerk

Train like a winner under the guidance of a winner.

World Champions, South African and African Champions, South African and Africa Record holders, Gold, silver and bronze medal winners and winners galore – this is synonymous with the 60-year career of one of South Africa's most respected and versatile coaches Owen van Niekerk. He is now sharing the secrets of his success in *Athletics Programmes and Programming!*
Some of the athletes who flourished under his guidance include (and we apologize that we can't list them all):

SPRINTS

Willie Smith - 100m 10.27/10.1 and 200m 20.2 SA Records; Greg Collin - 100m 10.1 and 200m 20.4; Warren McCann - 100m 10.32/10.1 and 200m 20.57; Nico Schutte - 100m 10.27; Loid Kgopong - 400m 45.47; Maryna van Niekerk - 100m 11,4/11,57; Corrien Botha - 100m 11,5; Marinda Fourie - 400m 52.94; Mimmie Snyman - 400m 50.97 seconds.

MIDDLE AND LONG DISTANCES

Helga van Wermeskerken - 800m 2:00.99sec Willie Farrell - Marathon 2:14.00 seconds

HURDLES

Stephan Lindeque - 110mh 13.50 SA Record; Rayan Dowling - 110mh 13,90/13,5; Francois du Toit - 110mh 13,91; Corrien Botha - 100mh 12,94 SA Record; Alison Colin - 100mh 13.22; Sanet Fouche - 100mh 13,23; Carla Fick - 100mh/100m13,23/11,7; Justine Robbeson - 100mH 13.56/13.30 LJ 6.27m; Ronelle Ullrich - 300mh/400mH 41.7/56.81 SA Records.

WALKS

Ricus Blignault - 20km Walk 1:26.47 sec and Mzwakhe Mavundla 3km -13:12 and 10 000m - 46:09.46:09.

JUMPS

Casper Labuschagne - HJ 2,28m; Ben Joubert - HJ 2,22m; Pierre Vorster - HJ 2,22m; CJ Roux - HJ 2,22m; Christo Very - HJ 2,21m; Heinrich Rix 2,21m; Gert Pieterse - HJ 2,20m; Gidius Botha - HJ 2,20m; Desiré du Plessis - HJ 2,01m SA and African Record; Fiona Daily - HJ 1,88m; Elma Hofmeyer - HJ 1,85m; Vickey Welthagen - HJ 1,85m; Gawie Malan - PV 5,28m SA Record; Steve Delport - PV 5,01m; Francoise Fouche - LJ 8,27m and 8.21m SA and African Records; Johan van der Merwe - LJ 8.06m SA Record; Felix Coetzee - LJ 7,99m; Wikus Olivier - LJ 7,94m; Johan Stroh - LJ 7,89m; Nico Schutte - LJ 7,88m; Stollie Kotze - LJ 7,85m; Willie Prinsloo - 7,86m SA Junior Records; Stollie Kotze - 7,83m; Vikter Shabangu - 7,81m; Vick Hagen - 7,79m; Sanet Fouche - LJ 6,73m; Almarie Brand - LJ 6,45m; Corien Botha - LJ 6,41m; Mornay du Plessis SA Junior Records - LJ 6,37m and 6,19m; Zinzi Chabangu - LJ 6,05; Hendrick Nell - TJ 15.91m SA Record; Willie Lyon - SA Record - TJ 15.94m; Wikus Olivier - TJ SA and African Record 16.98m; Thumalo Thagane 17.05m; Gerrit Giericke 15,87m; Gert Olivier 15,73m; Arlien Muller - TJ 12,81m SA Junior Records; Patience Ntshingila - LJ 6,60m/TJ13.87m SA Record; Catherine Makaya - 13,20m; Marina Gey von Pittius - TJ 13,03m; Zinzi Chabangu - LJ 6,32m and TJ 13,18m SA Junior Records; Dylon Cotter 8,16m.

MULTI-EVENS

Willem Coertzen - Decathlon 8146 pts; Herman Muller DC - 7100 SA Record; Willie Prinsloo - LJ/TJ/Hurdles and Pentathlon SA Records in all events; Justine Robbeson - Heptathlon 5868 SA Junior Record; Estelle du Randt - Pentathlon and Heptathlon SA Junior Records.

THROWING EVENTS

Eugene Nysschen - SP 19,42m; Henk Booysen - SP 19,34m; Cor Booysen - SP 19,30m; Ernst de Waal SP/DT 18,46m/57m; Johan van Zyl - DT 57m; Rouman Koprivtchen - HT 73,14m; Adriano do Sandtos - HT 68,90m; Christiaan Bekker - HT 65,93m; Johan van Zyl - HT 62,90m; Pieter Pretorius - HT 65,28m SA Record; Philip Spies - JT 84,02m; Lizanda Swanepoel - SP/15.93m; Sandra Willms - DT 57.40m; Louise Meintjes - HT 54.24m SA Record.

EXCEPTIONAL PERFORMERS

Godfrey Mokoena SA and African Record - LJ 8,50m; Patience Ntshingila LJ/TJ 6,60m and 13.89m; Desree du Plessis - HJ 2,01m SA and African Records; Justine Robbeson SA and African Records Pentathlon, World Junior Champion (Grosetto 2004); Carla Fick - 2nd 100mh World Youth Championships (Debrechen 2001); Mariette van Heerden SP/DC 17,32/58,14 SA and African Records; Corien Botha - 100mh 12,94sec, lately the young and talented Zinzi Chabangu in LJ/TJ 6,32m/13,60m and Maryna van Niekerk (wife of Owen) with multiple SA and African Records in Relays, Pentathlon/Heptathlon, LJ 6,80 and TJ 13,27 13,27m.

Its Van Niekerk's concern over the hap-hazard, unscientific way in which so many training programmes are put together that inspired him to share a life-time of experience in this book.

Simple and practical methods of creating and presenting programmes to achieve effective training objectives will be obtained if the book is studied and followed.

The book contains a gold mine of essential information for any person responsible for the training of an athlete; albeit a professional coach, the parents of an athlete, or the athlete him or herself.

Crammed with well-researched and proven technical guidelines, the information will enable you as a coach to develop a training regime for each of your athletes that will give him or her competitive edge both on the track and in the field.

Says Van Niekerk: "It is sad that our country is losing so many talented athletes through, incorrect training methods, unnecessary injuries and to overseas-based coaches. This is unfortunately a trend that will continue if we are not willing to use practical and scientific information to train them correctly."

"In order for us to produce world class athletes who reach their full potential by ages 20 to 28 and go through their careers without major injuries, we need to guide talented athletes correctly, ensuring that they take the right steps at the right time. That is what this book is all about."

BRIEF OVERVIEW OF CONTENT

Chapters 1, 2 & 3: Different guidelines on how to develop a programme for a specific athlete.
Chapters 4 & 5: Sprints - 100m, 200m and 400m.
Chapters 6 – 9: Middle and long distances as well as the steeplechase.
Chapters 10 & 11: Short- and long-hurdles.
Chapters 12: The walks.
Chapters 13 - 16: The high jump, long jump, triple jump and the pole vault.
Chapters 17 - 20: Shot put, discus, javelin and hammer throw.
Chapter 21: The multi events.
Epilogue.
References.

www.athleticstraining.co.za
www.athletics-training.com

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ABOUT THE AUTHOR

Owen van Niekerk is a very versatile coach who has coached more than 700 South African Champions. He has coached SA and African Record holders in many events. Although he is well known as a sprint, hurdle and jump coach, he has also coached many athletes in the multi events, throws as well as long and middle distances. He gained his vast knowledge and experience as the Head Coach of the SA Defense Force (30 years) and Head Coach of the very strong Rand Afrikaans University team (18 years). Although now on pension, he still coaches at the University of Potchefstroom and runs his own club in Johannesburg. He also spent 5 years doing extensive research on the development of young athletes at a primary school in Johannesburg.

During his sporting career Owen received provincial colours for 10 different sports and national colours in Track and Field. He also held the SA and African Records for Triple Jump for 15 years and won SA Titles in the Decathlon. He was the national coach for Track and Field on various occasions, as well as the National coach of the first SA team which competed in the Winter Games in Lillehammer 1994.

Owen is an avid reader and collector of Track and Field books, which he religiously analyses in order to develop optimal training programmes for his athletes. He is passionate about the development of young athletes and continuously strives to improve his training methods through dedicated research. He is against the overtraining of athletes and strongly advocates rest and recovery as part of his programmes. He has done vast research into the development of pure speed, explosive spring exercises and of both the white and red muscle fibre types of athletes.

Owen van Niekerk

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CONTENTS

INTRODUCTION

WHY THIS BOOK?

Why this book form the well-known coach Owen van Niekerk? What makes this book different than all other athletic books? Well, it is based on years of research and experience by a very talented man. During a career spanning more than 65 years Owen has literally coached thousands of talented and not so talented athletes.

Over the years he has written programmes for athletes all over the country and overseas. The idea of this book about different programmes and how to develop programmes for individual athletes were born out of his experience of working with a variety of athletes. All these ideas developed because he was attending, meetings, looking at how his own athletes train and develop; how other coaches train their athletes and by comparing mistakes and successes. He had to think creatively and out of the box. He did research by testing and measuring, writing and comparing. He did not follow the rest of the world but created his own successful ideas based on his own research.

He came to the conclusion that training and certain training programmes do not always bring success and develop athletes to higher levels. He realized through all his experience that some training regimes can do more harm than good to an athlete and that athletes can stay at one level or even gets worse by doing the wrong types of training.

As the head coach of the SA Defence Force for 29 years and the later the head coach at the prestigious Rand Afrikaans University, he asked many questions about training methods; how to do the correct training and how to develop younger athletes. In a bit to get answers he did research on certain types of training and training programmes.

In the defence force the recruits were chased all over in army boots for kilometres “to get fit” for their army duty. Because of this type of training they were fit but not fast and Owen had to make them faster so that they could run and perform better as athletes. Here his ideas already started to take form.

When he was coaching athletes at university he was faced with a brand new set of challenges, but nearly the same as the above situation. When at varsity there are not many years of development left for any athletes. Sometimes the development that took place at school level did so much damage to the athletes that there was barely enough time for further improvement. Owen knew that there was not enough time to change the technical mistakes, and sometimes the damage, done at school level. During his long career he saw many talented athletes who never reached their full potential and he asked why?

During the above periods he became interested in the science of correct training methods for fast twitch and slow twitch but oxygen rich muscle fibres and the correct types of training programmes for athletes born with these different types of muscle fibres.

He had to think creatively and out of the box when planning the programmes for his athletes, hence this very exceptional book. His athletes were always carefully tested and evaluated before he developed their different programmes. He did his best to improve on what the athlete needed at that moment and did not copy programmes of other coaches and use programmes form other countries or the internet. He looked at the athlete in front of him and tried to work out what was the best for that athlete and his aim was always to develop the strong and weak points of that athlete as well. During a long career Owen not only coached but is still coaching hundreds of champions as well as young and upcoming athletes.

His worked enabled him to develop a book with special test for each track and field event. This book is based on different aspect or components for every event as well as the energy systems important for each event. This statistical information was developing though years of experience and research. The book is: GRADUATED TABLES FOR PERFORMANCE OPTIMIZATION IN TRACK AND FIELD ATHELTES *and is available on* www.athletics-training.co.za *and will download as an electronic book*.

CHAPTER 1

HAS YOUR ATHLETE GOT WHAT IT TAKES?

One of the main reasons of this book is to make people aware of the importance of the different muscle fibres in humans and to urge coaches, parents and teachers to do the correct type of training for these different fibre types.

Secondly to make people aware of the fact that the wrong training can damage these fibres and if a coach for example does too much long distance training the fast twitch fibres becomes slow. If a coach does not do enough fast training with long distance athletes at a certain age for example, they will never run faster when older.

Thirdly, athletes with different fibre types need different training programmes. Different events also need different types of training methods. A coach cannot train a group of athletes on the same programme year after year. Nor can a group of 20 athletes train on the same programme. Such a programme might only benefit 1 out of the group and the other 19 athletes might not develop.

Following is a sort summary of the most important aspect of muscle fibres and their importance on training and the development of training programmes:

THE IMPORTANCE OF MUSCLE FIBRE TYPES AND THE DEVELOPMENT OF TRAINING PROGRAMMES

How human movement and skeletal muscles adapt to repeated stimuli depends on the inherent characteristics of the muscles and the fibres inside. These types of fibres that make up the individual muscles have an impact on movements that will greatly influence the way an athlete or athletes will adapt to a training programme and perform in certain events. All the training programmes in this book are based on the differences between fast twitch and slow twitch muscle fibres.

There is a reason why some athletes can sprint faster, jump further, run hurdles better, get bigger muscles more easily than others and why some athletes are able to run for much longer periods of time without getting tired. Not all muscle fibres are alike and in order to design a training programme that will work the best for each individual athlete, it is important for a coach, teacher or parent to understand at least some of the complexity of these skeletal muscles, the energy systems of the body, different muscle fibre types. It is important to realize to train item specific and each event consists of its own unique components.

Humans have basically three different types of muscle fibres and there is a ratio difference between these fibres. They derive their names from the difference in the speed of action and the energy supply. These muscle fibres can be divided into:

1. **Slow Twitch Fibres** (ST of Type I). These are red in colour and characteristically their contraction time is slow but with a high resistance to fatigue. This means that the working capacity is much longer. Structurally, they have a small motor neuron and fibre diameter, a high mitochondrial and capillary density and high myoglobin content. On the energy side, they have a slow supply of creatine phosphate (a high-

energy substrate used for quick, explosive movements), slow glycogen content and a wealthy store of triglycerides (the stored form of fat). These fibres contain a few of the enzymes involved in glycolysis, but contain many of the enzymes involved in the oxidative pathways.

2. **Fast Twitch Fibres** (FT or Type II). These types of fibres are identified by a quick contraction time and slow resistance to fatigue. Characteristics of these muscle fibre types lie in the difference of speed of contraction that gives the fibres their names. This can partly be explained because of the rates of release of calcium by the sarcoplasmic reticulum, (the storage site of calcium in the muscles) and by the activity of the enzyme myosin-ATPase (that breaks down the ATP inside the myosin head of the contractile proteins). Both of these characteristics are faster and greater in fast twitch muscle fibres (Fitts & Widick, 1996; Harigaya & Swarts, 1996). Fast twitch fibres are then further divided into:
3. **Fast Twitch A** (FT-A or Type II A) and **Fast Twitch B** (FT-B or Type IIB). These Fast twitch or **FT-A fibres**, have a moderate resistance to fatigue and represent a transition between the two extremes of the slow twitch and fast twitch B fibres. Structurally they have a large motor neuron and fibre diameter, high mitochondrial density, a medium capillary density and medium myoglobin content. They are high in creatine phosphate and glycogen and medium in triglyceride stores.
   They have both a high glycolytic and oxidative enzyme activity. Functionally they are used for prolonged anaerobic activities with a relatively high force output, such as the 400m, 400mH or the 800m events.
   The fast twitch or **FT-B fibres**, are very sensitive to fatigue and are used for short anaerobic, high force production activities such as short sprints, 10m, 20m, 30m, the short hurdle sprints, jumping and throwing events. These fibres are capable of producing more power the slow twitch fibres. The FT-A and FT-B fibres have a large motor neuron and fibre diameter, but a low mitochondrial and capillary density and myoglobin content. These fibres are very high in creating phosphate and glycogen, but low in triglycerides. They contain many glycolytic enzymes but few oxidative enzymes.

Knowing that there are different muscle fibre types, we need to understand their significance and what role they play in physical activity and therefore also in the development programmes for all athletes as well as the development programmes of young athletes. The difference results primarily from different forms of myosin ATPase. This ATPase is the enzyme that splits the ATP to release energy to drive contraction or allow relaxation. Slow twitch fibres have slow form of myosin ATPase, whereas fast twitch fibres have a fast form. In response to neutral stimulation, ATP is split more rapidly in fast twitch fibres than in slow twitch fibres. As a result, fast twitch fibres have energy for contraction available more quickly than slow twitch fibres.

SUMMARY OF THE CHARACTERISTICS OF THE MUSCLE FIBRE TYPES

<table>
<tr><th rowspan="2">FIBRE TYPE</th><th colspan="2">FAST TWITCH (FT or Type II)</th><th rowspan="2">SLOW TWITCH
(ST or Type I)</th></tr>
<tr><th>FAST TWITCH B
(FT-B or FT IIB)</th><th>FAST TWITCH A
(FT-A or FT IIA)</th></tr>
<tr><td>Characteristics</td><td colspan="2">• White in colour
• Glycolysis is the source of ATP
• Less mitochandria
• Less myoglobin</td><td rowspan="2">• Red in colour
• Depend on oxidative phosphorylation for their ATP supply
• More myoglobin</td></tr>
<tr><td>• The pure type
• Strong and explosive</td><td>• Hybrid
• Mix between Type I and Type IIB</td></tr>
<tr><td>Contraction time</td><td>Very Fast</td><td>Fast</td><td>Slow</td></tr>
<tr><td>Size of motor neurons</td><td>Very Large</td><td>Large</td><td>Small</td></tr>
</table>