

Science and Football VI

The Proceedings of the Sixth World
Congress on Science and Football

Edited by

**Thomas Reilly and
Feza Korkusuz**

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Science and Football VI showcases the very latest scientific research into the variety of sports known as football. These include the games of association football, the rugby codes (union and league) and the national codes (American, Australian and Gaelic). The book aims to bridge the gap between theory and practice in football studies and presents important new work in key areas such as:

- biomechanics
- sports medicine
- paediatric exercise science
- match analysis
- environmental physiology
- physiology of training
- fitness assessment
- psychology
- social sciences.

Sports scientists, trainers, coaches, physiotherapists, medical doctors, psychologists, educational officers and professionals working in the range of football codes will find this in-depth, comprehensive text an essential and up-to-date resource of scientific information for their respective fields.

Thomas Reilly is Director of the Research Institute for Sport and Exercise Sciences at Liverpool John Moores University. He is President of the World Commission of Science and Sports and Chair of the International Steering Group on Science and Football.

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The papers contained within this volume were first presented at the Sixth World Congress on Science and Football, held in January 2007 in Antalya, Turkey.

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Preface

The current volume represents the proceedings of the Sixth World Congress of Science and Football. The event was held in Antalya, Turkey from 15–20 January 2007, hosted by the School of Physical Education and Sports, Ankara University in collaboration with the School of Physical Education and Sports at Middle East Technical University. The Congress continued the line of previous conferences held under the aegis of the International Steering Group on Science and Football. The series of conferences was initiated at Liverpool in 1987, later followed by meetings at Eindhoven (1991), Cardiff (1995), Sydney (1999) and Lisbon (2003). The proceedings providing a scientific record of these events have been published by E&FN Spon or by the publishers of this volume – Routledge.

The Steering Group on Science and Football is one of a number affiliated to the World Commission of Science and Sports. This body is charged by the International Council for Sports Science and Physical Education (ICSSPE) with building bridges between theory and practice in specific sports. It does so by orchestrating regular conferences and a major World Congress on a four-yearly basis, co-ordinated by the relevant Steering Group and publishing the proceedings. This publication therefore is a compendium of research activities and findings which are both up to date and relevant to practice. Its usefulness is reflected in the large number of citations evident in peer-review publications within mainstream journals and the applied nature of the contents.

The International Steering Group on Science and Football operates not just to effect links between research and its applications but also to identify common threads between the various football codes. The Congress therefore provides a unique opportunity for cross-fertilization between the football games and the transfer of ideas across them. The end result is a strengthening of sport science support work by extending the knowledge base from which personnel working in applied settings can draw.

The Sixth World Congress benefited from the administrative help provided by the staff of Serenas Tourism Congress Organisation Services and from its supporting institutions, namely the Turkish Football Federation, the Turkish National Olympic Committee and the General Directorate of Youth and Sport. Ernin Ergen and Feza Korkusuz shouldered the bulk of the organisational work, ably supported by their academic colleagues and the Scientific Programme Committee. Without the

support of their many colleagues from within the two universities and the highly efficient secretarial help from Biken Inanc, the Congress administration would have buckled under the enormous workload.

The Congress programme included keynote addresses, oral communications, posters, demonstrations, symposia and workshops. A special thanks goes to Surhat Müniroğlu for co-ordinating the link with the Turkish Football Federation and for setting up the workshops. Technical support at the formal sessions was ably implemented by the staff of Serenas.

The presentation of the Book of Abstracts for the Congress was facilitated by Hakim Gur, editor of the *Journal of Sports Science and Medicine*. These abstracts were published in a special supplement of the journal (Volume 6 No. 10, 2007). These are available at: <http://www.fssn.org>

An innovation at the closing ceremony of the Congress was the award of prizes in the open and poster categories prior to the passing of an Australian Rules football on to the organisers of the Seventh World Congress of Science and Football. The literal pass from podium to platform symbolised the inclusion of the different football codes at this gathering as well as the forward progression of the 'science and football' movement. The location of the next Congress was decided after formal presentations by candidates for host. The outcome was that Nagoya, Japan was selected as the site of the Seventh World Congress in 2011. The intervening years are likely to witness further burgeoning in research programmes to reach fruition for communication at this attractive forum for scientific exchanges.

Thomas Reilly
Chair, International Steering Group on Science and Football;
President of the World Commission of Science and Sports
(a service group of the International Council for
Sports Science and Physical Education)
July 2007

Introduction

This volume comprises the proceedings of the Sixth World Congress on Science and Football held in Antalya, Turkey in January 2007. It reflects the sustained research output in the different sciences applied to football in its various codes since the first of the series was published in 1988. A comparison of the content of the six volumes demonstrates how research programmes have paralleled developments within the games. All the football codes, international and national forms of football, are represented and the range of topics addressed testify to the fact that football is a fertile area for research investigation.

The contents represent a record of the subjects covered in the Sixth World Congress for those manuscripts having passed the peer review process. The ten parts of the book demonstrate similarities with previous volumes and illustrate a balance of work across these areas. Inevitably there is some overlap between different parts, for example injuries in young football players could find a place either in 'sports medicine' or 'paediatric exercise science'. Similarly, some of the contributions in the 'social sciences' section might have been included with 'paediatric exercise science'. The decision was based on attempts to provide a reasonable balance in the distribution of articles among the parts of the book.

Roughly one-quarter of the communications at the Congress were accepted for publication. The editors thank the authors for their careful preparation of manuscripts and also the referees for scrutinising the first drafts. A special note of thanks for coping with the nuances of the electronic submissions and revisions goes to Laura Ramsay and Zoe Miveld at the office of the Research Institute for Sport and Exercise Sciences at Liverpool John Moores University. Whilst the contents constitute but a fraction of the material presented and discussed at the Congress, they nevertheless provide a sizeable sample of activity at the event. They also identify for readers the areas of research into football that are currently attracting scientific investigation.

Thomas Reilly
Feza Korkusuz

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