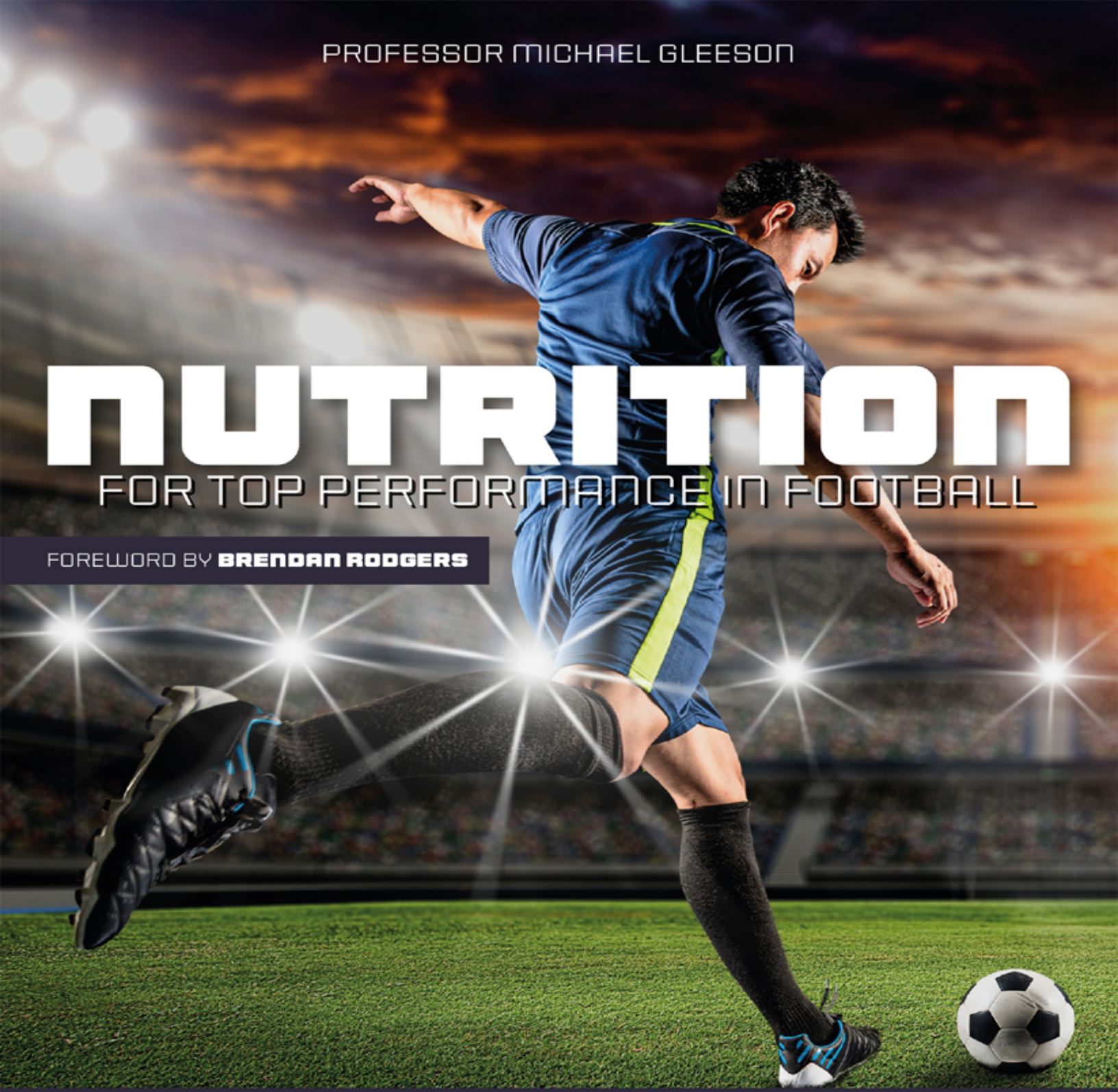
PROFESSOR MICHAEL GLEESON

NUTRITION

FOR TOP PERFORMANCE IN FOOTBALL

FOREWORD BY **BRENDAN RODGERS**



EAT LIKE THE PROS AND
TAKE YOUR GAME TO THE NEXT LEVEL

MEYER & MEYER SPORT

The content of this book was carefully researched. However, readers should always consult a qualified medical specialist for individual advice before adopting any new nutrition plan. This book should not be used as an alternative to seeking specialist medical advice.

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FOREWORD

While the fundamentals remain the same, football has changed dramatically in recent years. The modern game is an exciting spectacle with supporters across the world fanatically cheering on their team and many young children dreaming of becoming the next superstar. In truth, to get to the top takes a lot of hard work, dedication, and do not forget talent. Not only is the intensity of matches higher than ever before but teams are required to compete more regularly due to extremely congested fixture schedules. I pride myself on leading a team that plays with a high energy level, the ability to make continuous high-speed running actions and to a high technical level; all of which require the highest levels of football and physical fitness possible.

Given the increased demands placed upon the modern player, where possible, clubs seek to invest in Medical and Sports Science expertise while also developing cutting-edge facilities in an attempt to maximise the potential of their playing squad. It is of course my role to ensure that each department and individual brings a passion to their work, an expertise and knowledge of the subject that allows us to progress, an ability to communicate with the players in order to improve them and a persistence to ensure not only short but long-term development. I am continually looking to evolve in an attempt to ensure no stone is left unturned when it comes to the preparation of my players. Undoubtedly, nutritional support is a very important aspect for players to get right, which is why we must ensure high

standards at the training ground day in and day out. First and foremost, the food we provide must meet the needs of the players and should be tailored to the demands of training and match play. However, this doesn't mean it has to be boring; of course not. It is the role of the team chef to utilise healthy, lean produce to create exciting dishes bursting with flavour which will aid performance.

Historically, players may have only considered nutrition to be the measure of their percentage body fat, a crude marker of whether they were in appropriate shape or not. However, nutritional support is now so much more than that. Body composition is important in order to be strong, athletic and robust on the pitch and so, for many emerging talents, improving muscle mass and ensuring they are eating enough is important for their development. It is about educating the players in the hope that we can inform their decision making when it comes to food choices. It is now widely accepted that nutrition plays a very important role in performance. Players must fuel their bodies to perform at the highest intensity throughout the full 90 minutes. This doesn't just mean having a bowl of pasta three hours before kickoff; it is instead about the choices that are made and strategies that are in place throughout the days leading into a match. The need to fuel is just as important throughout the training week, with it being essential before tough training sessions when the squad are put through their paces. For me I expect the starting point to be the player's work ethic. Before strategy, tactics, theories, managing, organising, philosophy, methodology, talent or even experience you are dead in the water without this significant attribute.

Nutrition also plays a vital role after competitive matches and heavy training sessions, aiding recovery and supporting the body as it attempts to repair and adapt to the workload

undertaken. This is important for not only reducing the risk of injury among the squad, but also helps speed up the turnaround so I can safely work with the players on technical and tactical aspects on the pitch. Given the busy fixture schedule teams often face when competing in European competitions, it is important to identify windows of opportunity when the science can help accelerate the recovery process. Despite our best efforts, the stresses and strains of competition may take their toll on the body; however, clean, lean, healthy food can be a powerful medicine when it comes to reducing risk of illness and boosting player health. We should never underestimate the power that a nice meal has in improving our mood, boosting our energy levels, and helping support our immune system. Professional clubs tend to support their players by providing breakfast and lunch either side of training; however, the decisions which players make away from the training facility are just as important. Through this relentless pursuit of excellence, players begin to understand the level that they need to operate at and in time they change their habits, behaviours and ultimately expectations of the food they eat.

As you can tell, I see the importance of putting in place good nutritional support and that is why I entrust nutritionists and sports science staff to implement strategies which they deem appropriate. When it comes to experts on this specific area, Professor Michael Gleeson is a leader in the field. He has immersed himself in the science and literature throughout his career, sharing his insights and theoretical knowledge along the way which I know has helped shape the careers of so many practitioners working in sport today. Nutrition for Top Performance in Football is a fantastic resource for anyone looking to improve their knowledge and understand the effect that nutrition can have on performance. It doesn’t matter what age you are or what level you play at, this book is a great read for anyone

who is interested in improving their performance. It will also be of interest for anyone wanting to begin a career working in football as it provides valuable insight into how evidence-based guidelines are put into practice within the professional game. Enjoy the read and good luck in your pursuit of continued improvement, whatever your individual goal may be.

–Brendan Rodgers, Leicester City FC manager

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Many people have helped me to write this book and I am indebted to them for the helpful information, advice, insights and quotes they have provided me with. I have tried to list as many of them as I can remember here and I apologise if I have omitted anyone. Any mistakes you find in this book are unintentional and entirely my own. I particularly want to thank all the co-authors of the 2020 UEFA Expert Group Statement on Nutrition in Elite Football, namely (in the order in which they are listed in the paper): James Collins, Ronald Maughan, Johann Bilsborough, Asker Jeukendrup, James Morton, Stuart Phillips, Lawrence Armstrong, Louise Burke, Graeme Close, Rob Duffield, Enette Larson-Meyer, Julien Louis, Daniel Medina, Flavia Meyer, Ian Rollo, Jorunn Sundgot-Borgen, Benjamin Wall, Beatriz Boullosa, Gregory Dupont, Antonia Lizarraga, Peter Res, Mario Bizzini, Carlo Castagna, Charlotte Cowie, Michel D'Hooghe, Hans Geyer, Tim Meyer, Niki Papadimitriou, Marc Vouillamoz and Alan McCall. I am also extremely grateful to Brendan Rodgers for writing the foreword to this book and explaining the importance of nutrition in elite football from an expert manager's perspective. My grateful thanks for anecdotes, quotes (in person or from books and media articles), edits and/or comments also go to: the late George Best and Nick Broad, James Collins, Julian Dowe, Becky Dowst, Sam Erith, Sir Alex Ferguson, Pep Guardiola, Ilkay Gundogan, Harry Kane, Trevor Lea, Don Maclaren, Ron Maughan, Alan McCall, Brian McClair, James Morton, Jordan Nobbs, Tom Parry, Matt Reeves, Alex Savva, James Sinclair,

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CHAPTER 1

Does Nutrition Really Matter in Football?

Firstly, I want to thank you for buying *Nutrition for Top Performance in Football*, or if you're from across the pond, *Nutrition for Top Performance in Soccer*, and congratulate you on your decision. The aim of this book is to provide you with an insight into nutrition for football (or soccer as the game is called in some parts of the world, such as in North America, Australasia and the Pacific Islands). In other words,

I will describe what elite football players eat and drink and explain some of the science that underpins the current recommendations made by nutrition experts. If you are an amateur player at any level – from national amateur leagues to pub teams – you can use the same nutritional strategies as the top professional players to improve your own game, increase your endurance, recover more quickly and avoid illness. This book is aimed primarily at the amateur player, but it will also be of interest to professional players, academy players (and their parents), nutritional, medical and sport science support staff, football coaches, managers, match officials and frankly anyone who is a fan of the beautiful game. For secondary school, college and university students studying physical education, sport science or sports nutrition this book will provide a useful resource and an understanding of how nutrition research can be applied in a real-world sport setting.

Nutrition is an important issue in many sports and football is no exception because it plays a crucial role in the health of the individual, in adaptations to exercise training, in weight maintenance and in match performance, whether by professional players or by those who play the game for fun or for health reasons. Indeed, nutrition influences nearly every process in the body involved in energy production, adaptation to training and recovery from exercise. If we look back 30 years or more, nutrition was largely ignored by those involved in professional football. Nowadays, it is seen as an essential component to maximise player performance, health and recovery as outlined in the foreword by Brendan Rodgers.

WHY NUTRITION IS IMPORTANT FOR FOOTBALL PERFORMANCE

Pep Guardiola, current manager of Manchester City and one of the most successful managers in club football, puts it very simply: ‘For me the food is so important in football.’

So why exactly is nutrition considered to be so important for football performance now, when quite frankly, it wasn’t only some 30 or so years ago? A good place to start is by quoting Arsène Wenger, the former Arsenal manager who was tasked by the Union of European Football Associations (UEFA) with writing an editorial in 2020 about his perception of the role of nutrition in football. He stated: ‘The goal of any elite team is performance – to win as many matches as possible over the duration of the season. To achieve this performance there are myriad factors that are involved including technical, tactical, mental and physical qualities. One area that I have advocated for many years (as early as the 1980s) that can help us achieve our performance goals is “nutrition”, an area which has grown in importance within the game.’

For the manager or coach, according to Mr Wenger, nutrition has the following objectives (figure 1.1) within the performance model: ‘(1) To ensure that players are in the best physical condition for the match: with an optimal level of body fat and muscle mass; (2) to accelerate their recovery from the previous match or from hard training sessions; (3) that players are fuelled and have the energy to sustain the intensity for 90 minutes or even more if called upon; and (4) to support an overall healthy, balanced lifestyle both inside and outside of the club environment.’

Playing football involves lots of running with repeated, high-intensity actions interspersed by periods of less-intense physical activity over the course of a 90-minute match. An elite soccer player typically covers at least 10 km (6 miles) in a 90-minute match with about 600 metres covered at full

sprint speed. Heart rate is maintained at about 85% of maximum and the total amount of energy expended by players who complete the full 90 minutes is about 1,600 kilocalories (kcal) with around 60–70% of that energy coming from carbohydrate. Match play involves not only running but also various in-play actions, such as jumping, tackling, passing the ball, dribbling and shooting. In addition, mental functioning is important for the timing of ball strikes and tackles, quick reactions, passing accuracy, decision making and staying concentrated. All of these are affected by fatigue. Minimising fatigue relative to the opposing team is an important strategy in football, because most goals are conceded in the last few minutes of each half (figure 1.2) and are commonly attributed to fatigue. Appropriate nutrition can address two of the major contributors to the development of fatigue, namely carbohydrate depletion and dehydration. In addition, some dietary supplements such as creatine, beetroot juice and caffeine can produce small improvements in performance in some players. Recovery starts immediately after the match ends, and nutrition is crucially important at this time for muscle repair and refuelling, particularly in congested fixture periods when the next match can be less than 72 hours away. Appropriate food choices and timing are also important to allow a player to perform hard training, avoid illness, reduce injury risk, maintain mental concentration, sleep well, maintain an appropriate body weight and composition, and recuperate from injury (see the infographic at the end of this chapter).

picture alliance / Marius Becker/dpa | Marius Becker

Photo 1.1 Arsène Wenger, one the first top managers to appreciate the importance of nutrition for the performance, recovery and health of footballers.

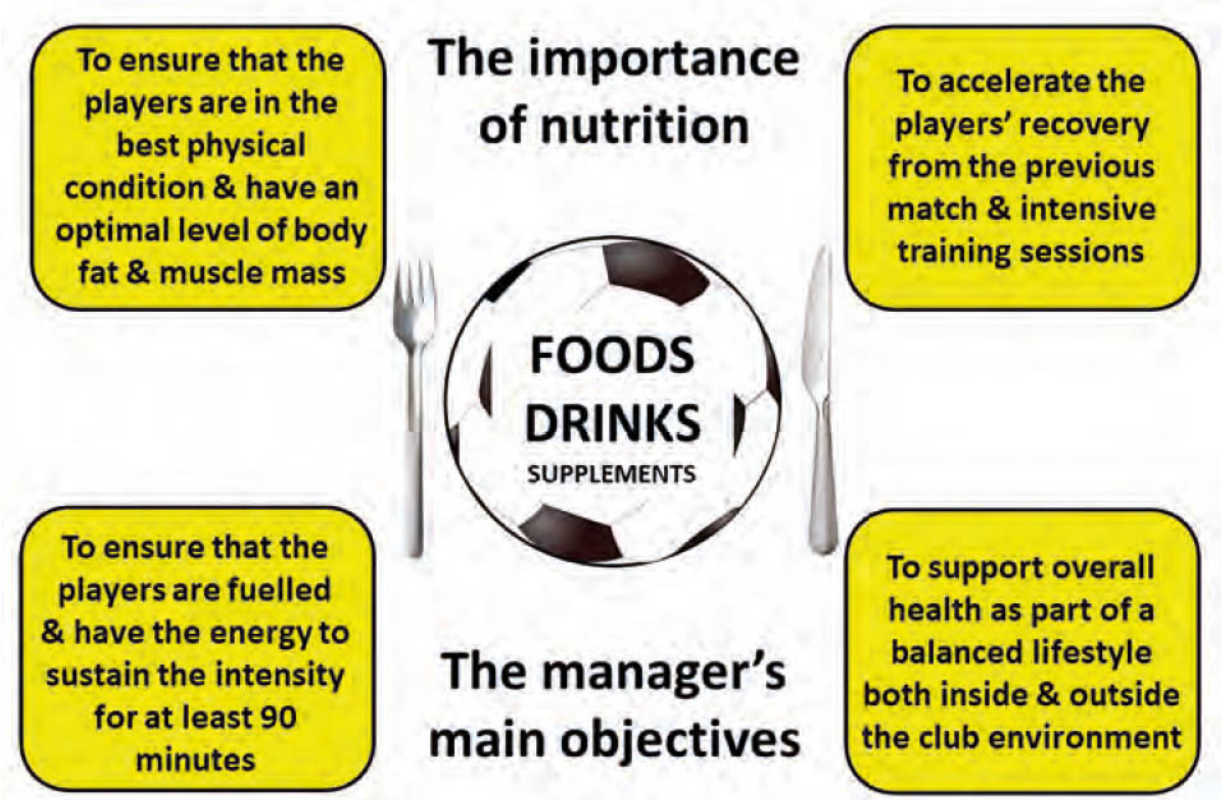

Figure 1.1 The coach's perception of the importance of nutrition in the club's football performance model (according to Arsène Wenger).

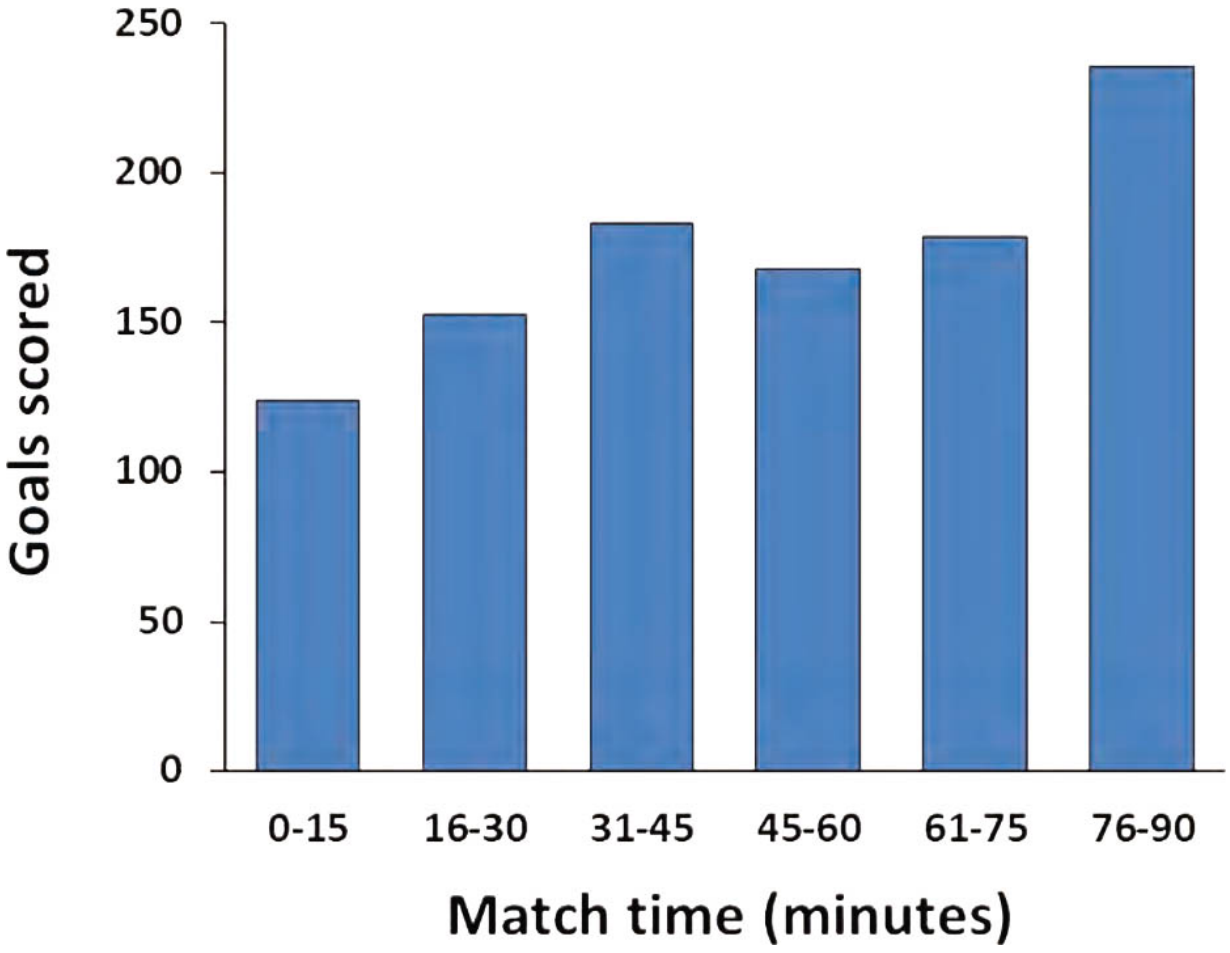

Figure 1.2 Average number of total goals scored in the English Premier League in the five full seasons from 2015–2016 to 2019–2020 during different periods of a match. The values for periods 31–45 and 76–90 minutes include added time.

It is important to appreciate that the amount and type of physical activity that a player does varies from day-to-day and that nutrition in football is what scientists call ‘periodised’ meaning that the diet changes to suit the players’ specific training and match schedule. The concept of periodised nutrition is fully embraced by all top football clubs and, although every club will do things a little differently, the core elements of a nutrition plan will be essentially the same. Each player will receive a nutrition plan in the form of a day-by-day calendar that is tailored to their individual needs, which will depend on their body size, body composition, playing position, training load and

training goals, their involvement in match play and their health status (by that I mean that the plan will change drastically if a player cannot play or train due to injury or illness, or is undergoing a period of recuperation from injury). Table 1.1 provides an example of a typical weekly periodised nutrition plan for a healthy player who plays one match per week. Note that the percentage contribution of protein to daily energy intake remains relatively constant, but the relative contributions of carbohydrate and fat vary more widely from day-to-day to accommodate pre-match carbohydrate loading and post-match carbohydrate replenishment.

So, the answer to the question ‘does nutrition really matter in football?’ is yes, it does. It matters very much indeed. Good nutrition may not make a footballer with average talent into a world-class player, but it can improve endurance, delay both physical and mental fatigue and speed up recovery – an important consideration not only for the professionals but also for many amateur players who may have a tiring match on a Sunday morning and have to go to work on Monday. It is also true that a poor choice of food and beverages can make an elite footballer become a pretty average player.

WHO AM I?

I am a recently retired university professor who has spent the last 45 years of his life teaching, researching and writing in the field of exercise physiology, metabolism, immunology and health with a particular interest in sport nutrition and a love of watching football. My last two academic positions were at the University of Birmingham and Loughborough University, two of the top universities in the world for sport and exercise science. I have authored several books on the

biochemistry of exercise and training, immune function in sport and exercise, nutrition for sport, a trilogy of healthy lifestyle guidebooks and contributed chapters to more than 30 other books. I have published over 250 research papers in scientific and medical journals, and much of this was focused on the well-being of athletes, including footballers, and the factors influencing their performance.

Table 1.1 A typical weekly nutrition calendar showing daily needs for a professional player

Day	MD-4	MD-3	MD-2	MD-1	MD	MD+1	MD+2
Main activity	Intense training	Moderate training	Intense training	Light training	Match play	Recovery	Light training
Energy (kcal)	3,300	3,000	3,300	2,800	3,500	2,500	2,800
Carbohydrate (g/kg BM)	6.0	5.5	6.0	6.5	7.5	6.0	5.7
Carbohydrate (g)	440	405	440	488	562	453	430
Carbohydrate (%EI)	53	54	53	70	64	72	61
Protein (g/kg BM)	1.8	1.6	1.8	1.4	1.8	1.4	1.5
Protein (g)	135	120	135	105	135	105	113
Protein (%EI)	16.4	16.0	16.4	15.0	15.4	16.8	16.1
Fat (g/kg BM)	1.5	1.3	1.5	0.6	1.0	0.4	0.9
Fat (g)	110	100	110	48	78	30	70
Fat (%EI)	30	30	30	15	20	11	22

MD = match day. %EI = percentage of total daily dietary energy intake. g/kg BM = grams per kilogram body mass. The daily energy expenditure and amounts of carbohydrate, protein and fat are based on a player weighing 75 kg and playing a full match on one day per week with weekly energy intake sufficient to match weekly energy expenditure.

My longstanding interest in football began when my father took me to watch my first live match in 1961. It was at Boundary Park, home of Oldham Athletic, my hometown team that I have supported ever since. I was only five years old and would not have been able to see anything with the supporters standing all around us, but my dad perched me on his shoulders and as he was 6 ft 4 in (1.93 m) tall I probably had the best view in the ground! Oldham beat Mansfield Town 3–1 that day and I was hooked. I have loved the game from that day onwards. Oldham may not be the most fashionable or successful team in England, but in my lifetime, they have had their moments including beating the likes of Manchester United, Liverpool and Chelsea when, for a few years in the early 1990s, they made it into the Premier League. Currently they are back in the same division as when I saw them first play; so is Mansfield Town.

Many of my former university students now work in sport science support roles at major football clubs including several in the English Premier League and the North American Major Soccer League (MLS). I occasionally provide nutrition advice to Leicester City FC, who became the Premier League Champions in 2016 as 5,000–1 outsiders and won the FA Cup for the first time in their history in 2021. Leicester is the other team I support, having lived not far from the city for the past 35 years. Plus, Matt Reeves, who is the Head of Fitness and Conditioning at the club, is a past student and a friend of mine.

Photo courtesy of Michael Gleeson.

Photo 1.2 The author (far left) with members of the Leicester City FC team support and management staff at the King Power Stadium in 2009. A very young Matt Reeves is on the far right.

WHAT IS DIFFERENT ABOUT THIS BOOK?

This book is unique as it provides useful and (hopefully) interesting information about what footballers eat and drink and – more importantly – explains what they are recommended to eat and drink (and when) by football nutrition experts. This information is based on the 'UEFA expert group statement on nutrition in elite football', which was first published online in October 2020 in the *British Journal of Sports Medicine*. The authors of the paper were

experts in applied sports nutrition research as well as practitioners working with elite clubs and national associations and were asked to issue a statement on a range of topics highly relevant to elite football nutrition. These topics included match-day nutrition (e.g. what to eat and drink on match day), training nutrition (e.g. what to eat and drink on training days), body composition (e.g. what is the desired body composition of a player and how it can be changed), stressful environments and travel (e.g. the influence of playing in the heat or cold or at altitude as well as long-distance travel challenges), cultural diversity and dietary differences (e.g. the implications of things like Ramadan and vegan diets), dietary supplements (e.g. which supplements might improve performance or training adaptation), rehabilitation (e.g. what can be done to optimise the rehabilitation from injury process and accelerate return to play), the specific nutritional needs of referees and junior high-level players and differences between the needs of elite male and female players (figure 1.3). I contributed to the writing and editing of this landmark paper – the first one of its kind since 2006 – but I have attempted to explain it all in simpler terms in this book – at least in a way that any reasonably intelligent person can understand.

As well as giving evidence-based guidelines to optimise football performance through appropriate nutrition, the book also provides some amusing anecdotes about the history of football nutrition, comments from people that I have worked with in the professional game, and some of the obscure, and even absurd, food and beverage choices that professional footballers have made over the years, including right up to the present day. It also provides numerous meal plans and recipes to allow anyone to emulate exactly what the professional players are eating.

Football nowadays is a truly global game that is constantly evolving. Over the past decade, there have been substantial increases in the physical and technical demands of match play. Now, players do more high-intensity actions, more sprinting and more tracking back. Some teams adopt what is called a pressing style of play, meaning the forwards and attacking midfielders, in particular, are expected to put pressure on opposition defenders who have the ball in an attempt to regain possession while still in the attacking third of the pitch. This, of course, requires more running and tackling from those attacking players. In order to cope with these increased demands, teams' training regimens have become more multidimensional, in an attempt to prepare players optimally to cope with such evolutions and to address individual player needs. As part of this multidimensional approach, nutrition can play a valuable integrated role in optimising the performance of elite players during training and match play, and in maintaining their overall health throughout a long season. An evidence-based approach to nutrition that emphasises, a 'food first' philosophy (i.e. prioritising food over supplements to meet nutrient requirements) is fundamental to ensure effective player support. This requires relevant scientific evidence to be applied according to the constraints of what is practical and feasible in the football setting.