Contents

VII  List of Contributors
IX  Preface
Koletzko, B. (Munich); Shamir, R. (Petach Tikva/Tel Aviv); Turck, D. (Lille); Phillip, M. (Petach Tikva/Tel Aviv)

1 The Physiology and Mechanism of Growth
Grimberg, A. (Philadelphia, PA); Phillip, M. (Petach Tikva/Tel Aviv); Wong, J. (Glasgow); Ahmed S.F. (Glasgow)

16 Obesity, Metabolic Syndrome, and Nutrition
Shalitin, S. (Petach Tikva/Tel Aviv); Battelino, T. (Ljubljana); Moreno, L.A. (Zaragoza)

52 Term and Preterm Infants
Turck, D. (Lille); van Goudoever, J.B. (Amsterdam)

80 Cognition
Agostoni, C.; Bettocchi, S. (Milan)

95 Nutrition and Growth in Chronic Disease
Hartmann, C. (Haifa); Shamir, R. (Petach Tikva/Tel Aviv)

118 Early Nutrition and Its Effects on Growth, Body Composition, and Later Obesity
Lind, M.V.; Larnkjær, A.; Mølgaard, C.; Michaelsen, K.F. (Copenhagen)

134 Malnutrition and Catch-Up Growth during Childhood and Puberty
Yackobovitch-Gavan, M. (Petach Tikva/Tel Aviv); Bhutta, Z.A. (Toronto, ON/Karachi)

152 Pregnancy: Impact of Maternal Nutrition on Intrauterine Fetal Growth
Hiersch, L.; Yogeve, Y. (Tel Aviv)

165 Stunting in Developing Countries
Prentice, A.M. (Banjul/London)

175 Author Index
184 Subject Index
List of Contributors

Carlo Agostoni
Pediatric Clinic
Department of Clinical Sciences and Community Health
University of Milan
Fondazione IRCCS Cà Granda Ospedale Maggiore Policlinico
IT–20122 Milan (Italy)
E-Mail: carlo.agostoni@unimi.it

S. Faisal Ahmed
Developmental Endocrinology Research Group
Royal Hospital for Sick Children
University of Glasgow
Yorkhill, Glasgow G3 8SJ (UK)
E-Mail: faisal.ahmed@glasgow.ac.uk

Tadej Battelino
Department of Pediatric Endocrinology, Diabetes and Metabolism
UMC-University Children’s Hospital
Bohoriceva 20
SI–1000 Ljubljana (Slovenia)
E-Mail: tadej.battelino@mf.uni-lj.si

Silvia Bettocchi
Pediatric Clinic
Department of Clinical Sciences and Community Health
University of Milan
Fondazione IRCCS Cà Granda Ospedale Maggiore Policlinico
IT–20122 Milan (Italy)
E-Mail: pilla.sma@gmail.com

Zulfiqar A. Bhutta
The Hospital for Sick Children
Research Centre for Global Child Health
University of Toronto
Department of Nutritional Sciences
Division of Women and Child Health
Aga Khan University, Karachi (Pakistan)
E-Mail: zulfiqar.bhutta@aku.edu or zulfiqar.bhutta@sickkids.ca

Adda Grimberg
Pediatric Endocrinology and Diabetes
The Children’s Hospital of Philadelphia
34th Street and Civic Center Blvd.
Philadelphia, PA 19104-4399 (USA)
E-Mail: grimberg@email.chop.edu

Corina Hartman
Pediatric Gastroenterology Unit
Lady Davis Carmel Medical Center
7 Michal Street
34362 Haifa (Israel)
E-Mail: CorinaH@clalit.org.il

Liran Hiersch
Department of Obstetrics and Gynecology
Lis Maternity Hospital
Tel Aviv Medical Center, Tel Aviv (Israel); and Sackler Faculty of Medicine
Tel Aviv University
39040 Tel Aviv (Israel)
E-Mail: lirhir@gmail.com

Berthold Koletzko
Division of Metabolic and Nutritional Medicine
Dr. von Hauner Children’s Hospital
University of Munich Medical Centre
Lindwurmstr. 4
DE–80337 Munich (Germany)
E-Mail: office.koletzko@med.uni-muenchen.de

Anni Larnkjær
Department of Nutrition, Exercise and Sports
University of Copenhagen
Rolighedsvej 30
DK–1958 Frederiksberg C (Denmark)
E-Mail: ala@nexs.ku.dk

Mads V. Lind
Department of Nutrition, Exercise and Sports
University of Copenhagen
Rolighedsvej 30
DK–1958 Frederiksberg C (Denmark)
E-Mail: madslind@nexs.ku.dk
Kim F. Michaelson  
Department of Nutrition, Exercise and Sports  
University of Copenhagen  
Rolighedsvej 30  
DK–1958 Frederiksberg C (Denmark)  
E-Mail: kfm@nexs.ku.dk

Christian Mølgaard  
Department of Nutrition, Exercise and Sports  
University of Copenhagen  
Rolighedsvej 30  
DK–1958 Frederiksberg C (Denmark)  
E-Mail: cm@nexs.ku.dk

Luis A. Moreno  
GENUD (Growth, Exercise, Nutrition, and Development) Research  
University School of Health Sciences  
University of Zaragoza  
ES–50009 Zaragoza (Spain)  
E-Mail: lmoreno@unizar.es

Moshe Phillip  
The Jesse Z. and Sara Lea Shafer Institute of Endocrinology and Diabetes,  
National Center for Childhood Diabetes  
Schneider Children’s Medical Center of Israel  
Petach Tikva (Israel);  
and Sackler Faculty of Medicine,  
Tel Aviv University, 39040 Tel Aviv (Israel)  
E-Mail: mosheph@post.tau.ac.il

Andrew M. Prentice  
MRC Unit The Gambia, Banjul, Gambia; and  
MRC International Nutrition Group,  
London School of Hygiene & Tropical Medicine,  
Keppel Street, London WC1E 7HT (UK)  
E-Mail: Andrew.Prentice@lshtm.ac.uk

Shlomit Shalitin  
The Jesse Z. and Sara Lea Shafer Institute of Endocrinology and Diabetes,  
National Center for Childhood Diabetes  
Schneider Children’s Medical Center of Israel  
Petach Tikva (Israel);  
and Sackler Faculty of Medicine,  
Tel Aviv University, 39040 Tel Aviv (Israel)  
E-Mail: Shlomits2@clalit.org.il

Raanan Shamir  
Institute of Gastroenterology, Nutrition and Liver Diseases  
Schneider Children’s Medical Center of Israel  
Clalit Health Services  
Petach Tikva (Israel);  
and Sackler School of Medicine  
Tel Aviv University  
39040 Tel Aviv (Israel)  
E-Mail: RaananS@clalit.org.il

Dominique Turck  
Division of Gastroenterology, Hepatology and Nutrition  
Department of Pediatrics  
Jeanne de Flandre Children’s Hospital;  
and Lille University Faculty of Medicine  
INSERM U995  
Avenue Eugène Avinée  
FR–59037 Lille Cedex (France)  
E-Mail: Dominique.TURCK@CHRU-LILLE.FR

Johannes B. van Goudoever  
Department of Pediatrics and  
Emma Children’s Hospital-AMC  
VU University Center  
Meibergdreef 9  
NL–1105 AZ Amsterdam (The Netherlands)  
E-Mail: h.vangoudoever@amc.nl

Jarod Wong  
Developmental Endocrinology Research Group  
Royal Hospital for Sick Children  
University of Glasgow  
Yorkhill, Glasgow G3 8SJ (UK)  
E-Mail: Jarod.Wong@glasgow.ac.uk

Michal Yackobovitz-Gavan  
The Jesse Z. and Sara Lea Shafer Institute of Endocrinology and Diabetes,  
National Center for Childhood Diabetes  
Schneider Children’s Medical Center of Israel  
14 Kaplan Street  
492035 Petach Tikva (Israel)  
E-Mail: MichalY@clalit.org.il

Yariv Yogev  
Department of Obstetrics and Gynecology  
Lis Maternity Hospital  
Tel Aviv Medical Center, Tel Aviv (Israel);  
and Sackler Faculty of Medicine  
Tel Aviv University  
39040 Tel Aviv (Israel)  
E-Mail: yarivy@tlvmc.gov.il
Preface

Over the years it has become clear that although nutrition is not the only important factor in child growth and may also not be the main factor that determines adult height, adequate nutrition is crucial for normal growth. Millions of children all over the world suffer from stunted growth because of their under- or malnutrition, which may affect not only their future growth, but also their cognitive development as well as limit their ability to develop their skills and become adults well integrated in society. Although the precise mechanism of the interaction between nutrition and growth has not been fully elucidated, a lot has been achieved since we published our previous Nutrition and Growth yearbook last year. Tremendous research efforts are invested all over the world in trying to understand the mechanisms leading to stunted growth, the right diet composition for optimal children growth, and the appropriate rehabilitation diet for children suffering from under- or malnutrition at all age groups during the growth period.

In the present volume, specialists in nutrition and growth selected some of the best studies from peer-reviewed journals published in the last year. The authors have chosen a limited number of manuscripts to share with the readers and added their comments on them. We realize we may have missed some other important studies which are also of value to the readers, even though we tried our best to achieve a comprehensive literature search. We hope that the summary of the published manuscripts and our comments will stimulate the readers to look for more manuscripts in the field, and that our comments will serve as “food for thought” which will lead to more studies. We believe that the interaction between nutrition and growth is a very important issue for growing children, their parents, and the medical teams treating them through the neonatal period, infancy, childhood, and adolescence. We believe that nutritional needs are different for each age group and encourage researchers to explore the field further.

This third yearbook on Nutrition and Growth is based on articles published from July 1, 2015 to June 30, 2016. We hope you will find the book helpful and useful.

Berthold Koletzko, Munich
Raanan Shamir, Petach Tikva/Tel Aviv
Dominique Turck, Lille
Moshe Phillip, Petach Tikva/Tel Aviv