

## Nutrition and Growth: Yearbook 2014

# **World Review of Nutrition and Dietetics**

**Vol. 109**

Series Editor

**Berthold Koletzko** Munich

---

# Nutrition and Growth

## Yearbook 2014

Volume Editors

**Berthold Koletzko** Munich

**Raanan Shamir** Petach-Tikva/Tel Aviv

**Dominique Turck** Lille

**Moshe Phillip** Petach-Tikva/Tel Aviv

2014

**KARGER**

Basel · Freiburg · Paris · London · New York · Chennai · New Delhi ·  
Bangkok · Beijing · Shanghai · Tokyo · Kuala Lumpur · Singapore · Sydney

---

**Berthold Koletzko**

Div. Metabolic and Nutritional Medicine  
Dr. von Hauner Children's Hospital  
Univ. of Munich Medical Centre –  
Klinikum d. Univ. München  
München  
Germany

---

**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  
Lille  
France

---

**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  
Tel Aviv  
Israel

---

**Moshe Phillip**

Jesse Z and Sara Lea Shafer Institute for  
Endocrinology and Diabetes  
National Center for Childhood Diabetes  
Schneider Children's Medical Center of Israel  
Petach-Tikva  
And Sackler Faculty of Medicine  
Tel Aviv University  
Tel Aviv  
Israel

Library of Congress Cataloging-in-Publication Data

Nutrition and growth (Koletzko)

Nutrition and growth : yearbook 2014 / volume editors, Berthold Koletzko,  
Raanan Shamir, Dominique Turck, Moshe Phillip.

p. ; cm. -- (World review of nutrition and dietetics, ISSN 0084-2230  
; vol. 109)

Includes bibliographical references and indexes.

ISBN 978-3-318-02565-1 (hbk. : alk. paper) -- ISBN 978-3-318-02566-8  
(electronic version)

I. Koletzko, B. (Berthold), editor of compilation. II. Shamir, Raanan,  
editor of compilation. III. Turck, Dominique, editor of compilation. IV.  
Phillip, Moshe, editor of compilation. V. Title. VI. Series: World review of  
nutrition and dietetics ; v. 109. 0084-2230

[DNLM: 1. Growth and Development--physiology--Collected Works. 2. Child  
Nutritional Physiological Phenomena--Collected Works. 3. Maternal  
Nutritional Physiological Phenomena--Collected Works. W1 WO898 v.109 2014 /  
WS 103]

QP84  
612.6--dc23

2013044986

Bibliographic Indices. This publication is listed in bibliographic services, including Current Contents® and PubMed/MEDLINE.

Disclaimer. The statements, opinions and data contained in this publication are solely those of the individual authors and contributors and not of the publisher and the editor(s). The appearance of advertisements in the book is not a warranty, endorsement, or approval of the products or services advertised or of their effectiveness, quality or safety. The publisher and the editor(s) disclaim responsibility for any injury to persons or property resulting from any ideas, methods, instructions or products referred to in the content or advertisements.

Drug Dosage. The authors and the publisher have exerted every effort to ensure that drug selection and dosage set forth in this text are in accord with current recommendations and practice at the time of publication. However, in view of ongoing research, changes in government regulations, and the constant flow of information relating to drug therapy and drug reactions, the reader is urged to check the package insert for each drug for any change in indications and dosage and for added warnings and precautions. This is particularly important when the recommended agent is a new and/or infrequently employed drug.

All rights reserved. No part of this publication may be translated into other languages, reproduced or utilized in any form or by any means electronic or mechanical, including photocopying, recording, microcopying, or by any information storage and retrieval system, without permission in writing from the publisher.

© Copyright 2014 by S. Karger AG, P.O. Box, CH-4009 Basel (Switzerland)

www.karger.com

Printed in Germany on acid-free and non-aging paper (ISO 9706) by Kraft Druck, Ettlingen

ISSN 0084-2230

e-ISSN 1662-3975

ISBN 978-3-318-02565-1

e-ISBN 978-3-318-02566-8

# 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 Obesity, Metabolic Syndrome and Nutrition**

Battelino, T. (Ljubljana); Shalitin, S. (Petach-Tikva/Tel Aviv)

### **23 Neonatal and Infant Nutrition, Breastfeeding**

Turck, D. (Lille); van Goudoever, J.B. (Amsterdam)

### **36 Cognition**

Hull, H.R.; Carlson, S.E. (Kansas City, KS)

### **54 Nutrition and Growth in Chronic Diseases**

Hartman, C. (Petach-Tikva/Tel Aviv); Altowati, M.A.; Ahmed, S.F. (Glasgow);  
Shamir, R. (Petach-Tikva/Tel Aviv)

### **89 Malnutrition and Catch-Up Growth during Childhood and Puberty**

Jee, Y.H.; Baron, J. (Bethesda, MD); Phillip, M. (Petach-Tikva/Tel Aviv);  
Bhutta, Z.A. (Toronto, ON/Karachi)

### **101 Pregnancy: Impact of Maternal Nutrition on Intrauterine Fetal Growth**

Yogev, Y.; Hirsch, L. (Petach-Tikva/Tel Aviv)

### **109 Author Index**

### **116 Subject Index**



## List of Contributors

### **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

### **Mabrouka A. Altowati**

Developmental Endocrinology Research Group  
Royal Hospital for Sick Children  
University of Glasgow  
Yorkhill  
Glasgow G3 8SJ (UK)  
E-Mail: m.altowati.1@research.gla.ac.uk

### **Jeffrey Baron**

National Institute of Child Health and  
Human Development  
National Institutes of Health, CRC, Room 1-3330  
10 Center Drive, MSC-1103  
Bethesda, MD 20892-1103 (USA)  
E-Mail: baronj@cc1.nichd.nih.gov

### **Tadej Battelino**

Department of Pediatric Endocrinology  
Diabetes and Metabolism  
UMC-University Children's Hospital  
Bohoriceva 20  
SLO-1000 Ljubljana (Slovenia)  
E-Mail: tadej.battelino@mf.uni-lj.si

### **Zulfiqar A. Bhutta**

Aga Khan University Hospital, Karachi  
Stadium Road, PO Box 3500  
PK-74800 Karachi (Pakistan)  
E-Mail: zulfiqar.bhutta@aku.edu

### **Susan E. Carlson**

University of Kansas Medical Center  
Department of Dietetics and Nutrition  
MS 4013, 3901 Rainbow Boulevard  
Kansas City, KS 66160 (USA)  
E-Mail: scarlson@kumc.edu

### **Corina Hartmen**

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  
IL-39040 Tel Aviv (Israel)  
E-Mail: CorinaH@clalit.org.il

### **Liran Hiersch**

Helen Schneider Hospital for Women  
Rabin Medical Center  
Petach-Tikva, Israel  
And the Sackler Faculty of Medicine  
Tel Aviv University  
IL-39040 Tel Aviv (Israel)  
E-Mail: liranH@clalit.org.il

### **Holly R. Hull**

University of Kansas Medical Center  
Department of Dietetics and Nutrition  
MS 4013, 3901 Rainbow Boulevard  
Kansas City, KS 66160 (USA)  
E-Mail: hhull@kumc.edu

**Youn Hee Jee**

National Institute of Child Health and  
Human Development  
National Institutes of Health, CRC  
Room 1-3330  
10 Center Drive, MSC-1103  
Bethesda, MD 20892-1103 (USA)  
E-Mail: youn.jee@nih.gov

**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

**Luis A. Moreno**

GENUD (Growth, Exercise, NUtrition and  
Development) Research Group  
Department of Physiatry and Nursing  
Faculty of Health Sciences  
C/Domingo Miral s/n  
ES-50009 Zaragoza (Spain)  
E-Mail: lmoreno@unizar.es

**Moshe Phillip**

The Jesse Z and Sara Lea Shafer Institute for  
Endocrinology and Diabetes  
National Center for Childhood Diabetes  
Schneider Children's Medical Center of Israel  
14 Kaplan Street  
IL-4920235 Petach-Tikva (Israel)  
E-Mail: mosheph@post.tau.ac.il

**Raanan Shamir**

Institute of Gastroenterology  
Nutrition and Liver Diseases  
Schneider Children's Medical Center of Israel  
Professor of Pediatrics, Sackler Faculty of  
Medicine, Tel Aviv University  
14 Kaplan St.  
IL-49202 Petach-Tikva (Israel)  
E-Mail: RaananS@clalit.org.il

**J.B. Hans van Goudoever**

Academic Medical Center  
University of Amsterdam  
Meibergdreef 9  
NL-1105 AZ Amsterdam (The Netherlands)  
E-Mail: h.vangoudoever@amc.uva.nl

**Dominique Turck**

Division of Gastroenterology  
Hepatology and Nutrition  
Department of Pediatrics  
Jeanne de Flandre Children's Hospital  
Lille University Faculty of Medicine  
INSERM U995  
Avenue Eugène Avinée  
FR-59037 Lille cedex (France)  
E-Mail: DTURCK@CHRU-LILLE.FR

**Yariv Yogev**

Helen Schneider Hospital for Women  
Rabin Medical Center  
Petach-Tikva, Israel  
And the Sackler Faculty of Medicine  
Tel Aviv University  
IL-39040 Tel Aviv (Israel)  
E-Mail: yarivy@clalit.org.il

## Preface

The relation between nutrition and growth in children is one of the key concerns of child health. The interaction between nutrition and growth poses a challenge to pediatricians, including subspecialists in pediatric nutrition, endocrinology and gastroenterology, pediatric nutritionists and dieticians, and other health professionals involved in the care of children. Thus, exchanging concepts and knowledge between the professionals of all the different disciplines is key to facilitating research and interdisciplinary clinical collaborations.

The growing interest in the relationship between nutrition and growth gave rise to numerous articles in various medical journals. With this in mind, we decided on publishing the first *Yearbook on Nutrition and Growth*. The main idea is to bring to practicing physicians succinct editorial comments, evaluating the clinical importance of each article and to discuss its application. The articles discussed in this book are those that have the most important potential contribution in the field. The studies might contribute to a better understanding of the mechanism of interactions, the way of thinking, the existing concepts in the field or that may lead to a change in the way we treat our patients.

The editors of the different chapters of the *Yearbook* are renowned experts in their fields who kindly agreed to share their views and wisdom. This first *Yearbook on Nutrition and Growth* is based on articles published from 1 July 2012 to 30 June 2013. We hope you will find the book useful for your work.

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

