Complementary Feeding: Building the Foundations for a Healthy Life
Complementary Feeding: Building the Foundations for a Healthy Life

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Preface

Good nutrition in the first 2 years of life is essential for the health and development of children with implications throughout life. Global recommendations are that babies be exclusively breastfed for 6 months and that breastfeeding be continued until at least 2 years, while complementary foods are to be introduced from about 6 months. Recognizing the importance of nutrition in young children, the 87th Nestle Nutrition Institute Workshop, which took place in Singapore on May 8–11, 2016, focused on complementary feeding as a foundation for healthy life. The objectives of the workshop were to share updates and recommendations on complementary feeding, as well as insights into strategies and interventions to promote healthy growth.

The first session of the workshop was an update on the evidence and practice of introducing complementary feeding, especially what foods and the timing of their use. Merryn J. Netting and Maria Makrides set the scene by highlighting the mismatch between complementary feeding guidelines and what often happens in practice across low- and middle-income countries as well as high-income countries. They outlined the key nutritional issues for infants during the complementary feeding period, especially the need for adequate iron and zinc. Jacqueline F. Gould continued the nutritional theme with her review of intervention studies of micronutrient supplementation or fortification during the complementary feeding period, and their effects on the developmental outcomes of children. Despite the importance of this topic, it was difficult to draw strong conclusions. Many of the available studies had extended intervention periods covering the period from pregnancy to mid-childhood, samples sizes were often small, and attrition was often high. Jordan R. Green et al. focused on the often forgotten area of textures of complementary foods and the need to match these to the oromotor development of the baby. They described sophisticated studies of chewing biomechanics to evaluate the age appropriateness of solid foods that vary in texture. The ultimate aim of these studies is to deliver science-based guidance regarding the safety and appropriateness of new foods, identifying
children at risk for choking or feeding impairments, and designing new developmentally appropriate foods. Our focus then shifted to the role of when to introduce complementary foods, especially the more allergic foods, if we are to reduce the risk of childhood allergies. Debra J. Palmer provided a comprehensive update on the most recent evidence which suggests that all complementary foods, regardless of whether they are considered allergenic or not, can be introduced into infant diets from 6 months of age as the infant is developmentally ready. In the final presentation of the session, Erin S. Ross addressed taste and flavor development and highlighted that exposure to a wide variety of tastes during the complementary feeding period has a strong influence on the food repertoire later in childhood and may be an important foundation to a healthy and varied diet.

The second session was a consideration of the current situation in low- and middle-income countries where both weight and length gains are commonly less than expected based on World Health Organization global growth standards. This growth faltering may occur in the first 6 months of life, especially if exclusive breastfeeding is not practiced, but is most acute in the second 6 months of infancy when complementary foods are essential to provide a sufficient diet. This is also a period in which infants are exposed to many microbes and have frequent infectious diseases, which contribute to their growth deficits along with insufficient and poor-quality diets due to inadequate complementary feeding. Presentations in this session considered the current problems with complementary feeding, the general recommendations that need to be adapted to local practices and available foods, and the indicators that are being widely used for population level assessments of feeding practices. Evidence was considered on how much effect has been found with nutritional counseling interventions and with food supplements that are often targeted to food-insecure populations. The gains in growth demonstrated in community trials of these interventions justify their application, but also research to improve their implementation and to identify interventions that would provide larger effects. The importance of vitamins and minerals, collectively called micronutrients, has been recognized, and recent approaches have centered on their provision either in fortified commercial complementary foods or products that can be mixed into complementary foods at home. The latter include micronutrient powders and lipid-based micronutrient products. The current status of the evidence of their effects was reviewed. There is also substantial interest in ready-to-use complementary foods made with local food ingredients. The experience with such products that have been developed and used in Bangladesh and China were considered.

The third session discussed factors involved in complementary feeding that influence healthy growth and development in the context of an obesogenic en-
environment. Hence, the emphasis was here on the prevention of rapid weight gain and the establishment of healthy eating habits. Ken K. Ong introduced the concept of early-life trajectories to later health. He described the wealth of evidence linking infancy weight gain to the risk of later obesity and discussed the underlying mechanisms. The recent advances in identifying genetic factors and infant appetite traits that contribute to these trajectories are leading to greater appreciation and understanding of parent-offspring interaction and signaling in infant feeding and weight gain. Maureen M. Black and Kristen M. Hurley analyzed the roles of the child and parent in infant feeding, and showed how the principles of responsive parenting can be applied to develop an approach to infant feeding that is responsive to infant cues but without the parent becoming indulgent to the child. They reported how interventions based on these principles may be applied to manage both infant food refusal and also infant overfeeding and obesity. Lynne A. Daniels described the development of such interventions in the context of anticipatory guidance to parents on the process of complementary feeding, which were tested in the NOURISH trial. While other large US trials are still in progress, she presented encouraging new data from the EPOCH study, a meta-analysis across four infant feeding trials in Australia and New Zealand. Finally, Anne M. Dattilo determined how infant feeding interventions might fit within a wider context of multicomponent early-life interventions that aim to change food- and diet-related behaviors, or feeding and associated lifestyle behaviors in the mother during pregnancy as well as in the infant and young child. Together, the session focused on early life as an important period for the development and prevention of obesity.

The format of the workshop was very conducive to discussion, and the participants were active in questioning the presenters and sharing their own experiences. As chairs of the workshop, and on behalf of all participants, we would like to thank Dr. Natalia Wagemans for the opportunity to highlight this subject of global importance. The arrangements were excellent and we also express our appreciation to the Nestlé Nutrition Institute and the local Nestlé team for the well-organized event.

Robert E. Black
Maria Makrides
Ken K. Ong
Foreword

The first 1,000 days of life, the time period from conception until 2 years of age, is the time in which the infant is the most vulnerable and which lays the foundation to its future health. The complementary feeding period from 6 to 24 months is part of the first 1,000 days during which infants undergo a huge developmental change with regard to bodily functions, personality, and will. The infant’s energy needs and nutritional requirements will exceed that what breastfeeding can provide and the child is developmentally ready to receive solid foods. During this transitional period, infants also progress from exclusively milk-based liquid diet to the family diet and self-feeding. Thus, the complementary feeding period is not just an important time to satisfy an infant’s nutrition, but also a time to form healthy food preferences and feeding practices, and to further stimulate the infant’s future healthy development. Inappropriate complementary feeding can lead to inhibition of growth and development, to unhealthy food choices and eating habits, and/or result in childhood obesity, all of which have detrimental consequences for long-term health and survival of the child.

The 87th Nestlé Nutrition Institute Workshop, held from May 8–11, 2016, in Singapore, was entitled ‘Complementary Feeding: Building the Foundations for a Healthy Life’ and was a scientific platform for key stakeholders to discuss and engage in the latest cutting-edge research surrounding the transitional complementary feeding period.

The workshop program has been designed in a very comprehensive way to cover the complementary feeding period with all challenges and successful practices taking differences and variations in all parts of the world in consideration.

The first session led by Prof. Maria Makrides addressed a fundamental topic on the role of complementary feeding in healthy growth and development focusing on the timing and type of solid food introduction. While highlighting the differences between complementary feeding recommendation and the actual practices around the world it was shown that guidelines from different countries have many similar consistent and important themes, including complementary
foods at/or around 6 months of age, continued breastfeeding, nutrient-dense complementary foods, hygienic food practices, development of feeding skills that nurture long-term healthy eating habits, and the prevention of micronutrient deficiencies and noncommunicable diseases such as obesity and allergy.

In the second session, chaired by Prof. Robert E. Black, the speakers examined the determinants of growth restriction and discussed effective interventions to improve complementary feeding practices and growth in infants and children in low- and middle-income countries. Determinants of these patterns of growth faltering include maternal factors (including age, height, and short birth intervals), pregnancy and birth conditions such as infections, and dietary factors. These factors contribute to fetal growth restriction, which put many infants on a lower growth trajectory. Dietary factors are important especially during the critical period of infancy as poor quality of complementary foods plays a vital role in growth faltering, while it can be prevented with dietary adequacy.

The last session led by Dr. Ken K. Ong has been focused on the importance and role of complementary feeding in development and ‘programming’ regarding behavioral and psychological aspects as well food preference in later life in high socioeconomic settings to prevent childhood obesity. The session discussion expanded on the topic of childhood obesity and modifiable risk factors associated with healthy growth as well as interventions addressing those associated with obesity prevention during the first 1,000 days. Childhood obesity is a strong predictor of adult obesity, and evidence from systematic reviews and meta-analyses suggests significant correlations between early childhood overweight, obesity, or measures of adiposity and modifiable factors during in utero development and early childhood. The importance of educating parents on the role of appropriate complementary feeding practices on long-term health outcome, building understanding and an open responsive environment during feeding time, helps parents to foster the child’s developmental capacities and build a strong foundation for healthy life…

We would like to thank the three chairpersons Maria Makrides, Robert E. Black and Ken K. Ong for putting the scientific program together. We also would like to thank all speakers and scientific experts in the audience for their contributions to the content of the workshop as well as for scientific discussions. Finally, we thank Dr. Grace Uy, Lin Angel, Christine Stillhart, and their teams for their logistic support.

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