Infant Formula: Closer to the Reference

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Preface

Eighty-six years ago, the first commercially manufactured infant formula, called “Synthetic Milk Adapter” (SMA), was developed by Dr. Henry Gestenberger at Western Reserve University in Cleveland, Ohio, USA. At that time, in 1915, Dr. Gestenberger had already stated as his goal: “The future will hopefully bring my goal to completion: to produce an infant formula with a composition nutritionally and biologically equivalent to that of human milk.”

We have come a long way on this development since 1915 and the body of scientific literature on infant nutrition is growing rapidly. New and interesting chapters focused on achieving an artificial nutritional model increasingly similar to that provided by Mother Nature are added every year. A fascinating challenge is at hand with today’s strong and justifiable emphasis on the importance of breast feeding. Working with infant formula requires being aware that the superiority of maternal milk lies not only in nutritive capacities, which are altogether suitable for achieving normal physical growth, but also in the capacity of breast milk to guarantee the best intellectual development and the lowest morbidity on a short-, medium-, and long-term basis. In the formulation of artificial milk, it is imperative that the objective be to obtain the same results as maternal milk feeding, independent of the strict and precise adherence to the structure and composition of human milk. This will ensure the development of important functions, such as the immune system and intestinal ecosystem, the prevention of some childhood and adult illnesses, and psychomotor development in accordance with genetic capacity.

In recent years, our increased knowledge of the biological functions of maternal milk has allowed us to look beyond its purely nutritional values. The optimal nourishment of an infant means not only providing a quantity of nutrients that meet food requirements, but also guaranteeing the supply of the nutrients themselves. The commitment and responsibility of achieving the best possible quality of life for each individual must be greater for those who care for human beings at the beginning of their existence. It is at this age when the organism is particularly sensitive and when early programming of metabolic processes occurs. At the root of much debilitating adult pathology lies the failure of proper feeding during infancy. In this way, each small scientific advance concerning the early stages of life can have great positive consequences later in life. The challenge becomes even more complex, and for this reason more fascinating, when dealing with preterm infants, because terms of reference are lacking and maternal milk is incapable of meeting all the nutritional needs of these infants. Preterm birth is accompanied by incomplete and immature structural and functional development that affects adaptation to extrauterine life. Our task is to try to prevent this initial disadvantage from becoming a permanent handicap.

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Foreword

Coming closer to the reference in infant feeding is a challenge for all infant formula manufacturers. There might be a chance to copy breast milk in the future by means of modern technology, but the question “which breast milk?” remains. Mothers produce milk individually for their baby and its composition changes with the duration of lactation as well as during the course of a feed. Milk composition also depends on the mother’s dietary habits. It is therefore logical to consider the metabolic outcome of the breast-fed infant as the reference.

Clinical trials comparing a new infant formula with “tailor-made protein” for younger infants are available now. They indicate that growth and key metabolic indices in infants fed those formulas are similar to the breast-fed reference group. In particular, the profile of essential amino acids, long-chain polyunsaturated fatty acids, and variables reflecting iron nutritional status are now very close in breast-fed and formula-fed infants. Feeding the new formulas also results in a lower renal solute load.

The data presented during this Nestlé Nutrition Workshop will be the basis for establishing safety and efficacy of new formulas taking the breast-fed infant as reference. We thank the chairmen Professor Niels Raihā and Professor Firmino Rubaltelli for establishing the program together, the speakers and all the participants for their invaluable contribution, and Nestlé Italy for their excellent organization and warm hospitality.

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