Given the documented short- and long-term advantages of breastfeeding, human milk as a sole source of nutrition for the first few months of life is considered a normative standard. Each macroconstituent of human milk plays a crucial role in growth and development of the baby. Lipids are largely responsible for the provision of more than 50% of the energy as well as for essential fatty acids and minor lipids that are integral to all cell membranes. Carbohydrates can be broadly divided into lactose and oligosaccharides, which are readily digestible sources of glucose and indigestible nonnutritive components, respectively. Proteins in human milk provide essential amino acids, which are indispensable for the growth of infants. What is more interesting is that protein concentration profoundly changes from colostrum to mature milk. In this report, we share data from an observational, single-center, longitudinal trial assessing the constituents of human milk collected 30, 60 and 120 days postpartum from 50 mothers (singleton deliveries of 25 male and 25 female infants). Human breast milk is highly dynamic [1–3] and has been shown to vary with the timing of expression, the side of the breast and the phase of the lactation cycle. These confounders were reduced in the study carried out by having early morning expression from the same side for each study subject. The breast milk was analyzed with the Miris milk analyzer for its energy, fat, carbohydrate as well as protein contents, and results were also confirmed using appropriate methods. The protein content decreased with evolving stages of lactation from an average of 1.45 to 1.38 g/100 ml (fig. 1). In contrast to our previous study [4] showing gender differences for lipid content 120 days postpartum, we did not reveal any gender differences in this trial. This finding was consistent with the previous literature on protein evolution of human milk during the first year of lactation. Despite the low protein content in breast milk, both groups of girls and boys managed to achieve normal growth during the study period regarding weight, height and also head circumference as per the World Health Organization Child Growth Standards [5, 6]. Further work will
be performed to analyze the dietary intake of the lactating mothers and to assess the macronutrients of breast milk as well as the other breast milk components.

References


Fig. 1. Human protein content in breast milk collected from Singaporean women over time.