Conclusions

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Dr. Räähä: We have now come to the end of the Workshop, and it is time to draw some conclusions. I think maybe the most important one follows something that Dr. Saavedra said: that we should really talk not about breast milk as the reference, but about the infant fed the breast milk. Dr. Agostoni said something similar again today; he said that breast milk is not the same as breast feeding. So I think this is a very important conclusion of the whole meeting that we should all bear in mind.

The first day we were talking about probiotics—different probiotics for different functions; there is no super probiotic. We were able to see that in infants and children receiving probiotics, there are effects on the prevention of diarrhea, and effects that could be classified as producing greater comfort, less diaper changing, and less constipation. All of these amount to greater comfort for the infant when probiotics are used with formula feeding.

We then came to the question of iron supplementation. It was concluded very clearly that a formula with iron at 4 mg/l of formula or even less is sufficient, and that for breast-fed infants, iron supplementation between ages 4 and 6 months will be likely to improve iron status. For babies older than 6 months, there are probably no very clear data as yet, but it was concluded that ~6 to 8 mg iron/l of formula after 6 months would be sufficient. For premature infants, iron supplementation may be toxic, and we heard about iron as a pro-oxidant.

We then discussed the question of protein quantity and quality in formula, and it was agreed, on the basis of Dr. Ziegler’s presentation and my own, that if we use high-quality protein, a protein/energy ratio of 1.8 g/100 kcal would meet the needs of term infants from birth to ≥4 months. We showed a study with a new formula, in which the quality of protein was altered not only by changing the whey-to-casein ratio but also by modifying the whey protein fraction. This formula contained 1.8 g protein/100 kcal. Dr. Ziegler showed the results of metabolic balance studies on this formula, and these showed satisfactory nitrogen balance. We also were able to show that blood urea nitrogen concentrations and plasma amino acid values were closer to those of breast milk than to a conventional control formula. In addition, I would like to clarify the growth data that we presented: from birth to 120 days, which was the duration of the study, there were no differences in weight gain between the standard formula and the reduced-protein formula. If we exclude the first month, during which differences may be related to variations in birth weight and time to regain birth weight, the weight gain in the two formula groups was almost identical, whereas the breast-fed group gained a little less, although not significantly so. So I think it is quite clear from this study that weight gain was not affected by the reduced-protein formula.
Then we turned to the question of feeding the preterm infant. Dr. Moro discussed individual fortification, with fine-tuning of the intake, and I think everybody was in agreement that if possible, this type of individual assessment should be used. We also discussed metabolic individualization, looking at blood urea nitrogen levels to gauge whether to increase or decrease the level of protein fortification given to the preterm infant. We discussed the very important question of postdischarge nutrient intake, and it became clear that there is much more to be done in that area.

On the final day, we discussed nucleotides, growth factors, and long-chain polyunsaturated fatty acids (LCPUFAs). It became clear that these are areas ripe for further study, especially the growth factors, and I am sure there will be interesting conclusions about their role in infant feeding when we have more information. Dr. Agostoni summarized the current thinking on LCPUFAs, an area in which we need to be very critical. Again, more studies must be done. Finally, Dr. Bachmann showed that lower concentrations of LCPUFAs can be used in infant formulas than those recommended to date.

That concludes my summary of the papers that have been presented here in the past 3 days.

I would now like to take this opportunity to thank Firmino Rubaltelli for his cooperation in setting up this program. We met once in Milan, and there was no disagreement whatsoever concerning the papers and the speakers. I also thank the President and the moderators of the sessions, the speakers, and those participating in the discussions. Last, but not least, I thank the Nestlé staff for a most excellent and stimulating meeting.

Prof. Rubaltelli: At the end of this workshop I think that we are asking ourselves, “What can we expect in the near future?” As a neonatologist, I see two age groups where nutritional problems must be solved: the nutrition of microprimies (<750 g) and the nutrition of infants of very, very low gestational age (VVLGAI) (<26 weeks). A special formula for the extremely low gestational age infant is needed, in addition to a special fortifier to add to the mother’s milk or to the human milk found in milk banks. These new formulae and fortifiers probably may contain prebiotics and probiotics in order to reduce the gut colonization of extremely dangerous germs responsible not only for necrotizing enterocolitis, but also for urinary tract infections and sepsis.

Another nutritional question also comes to mind: Must hydrolyzed proteins be used in order to improve feeding tolerance and enable a more rapid establishment of full enteral feeding? As outlined by Dr. Saavedra and mentioned by Prof. Raihá, in planning the composition of a new infant formula, the objective to be reached is to obtain not only growth similar to that obtained by the fetus in utero or normal full-term breast-fed newborns, but also to insure the prevention of some childhood and adult illnesses.

The large majority of microprimies and VVLGAI but also VLBWI are discharged from our nurseries with a weight, length, and head circumference well below the 10th percentile and very often below the 3rd percentile. A special post-discharge formula for these infants is probably necessary. However, we do not know how long they
need to be fed with special formulae, nor do we know the best strategies for improving the “catch-up” of these infants.

It is possible to hypothesize that in the future, cow’s milk obtained for manufacturing premature infant formula will contain immunoglobulins, like SigA, against the principal pathogens, which could colonize the newborn gut. Growth factors also appear to be a possible new entry in microprimie formula at high risk for necrotizing enterocolitis. Thus, the near future will probably be rich in new and improved products for infant nutrition. This will aid both in survival of microprimies and VVLGAI and in reduction of the incidence of infants with learning disabilities. It will also assure psychomotor development in accordance with the actual genetic capacities of these infants.