CORRESPONDENCE

Breastfeeding and Complementary Feeding—Recommendations on Infant Nutrition

by Dr. Christine Prell and Prof. Berthold Koletzko in issue 25/2016

Preventive Effect for Mother and Child

This is an important topic. The meta-analyses published in December 2015 in *Acta Paediatrica* and in January 2016 in *The Lancet* confirmed the prophylactic effect of breastfeeding for both mother and child.

Human breast milk contains much less protein than the milk of many other mammals. It is therefore important that any product used as a substitute for breast milk also has a low protein content. The authors write that breast milk substitutes fulfilling this requirement are on the market. However, this is incorrect; in fact, human breast milk contains only 0.9 g/100 mL protein (1), not, as stated, 1.2 g/100 mL (2). Moreover, the protein is composed partly of immune substances that are not available for digestion.

With regard to allergy prevention, the first 4 months of life seem crucial. A recently published meta-analysis casts doubt on whether the various hypoallergenic (HA) formulae actually have a hypoallergenic effect.

Introduction of complementary feeding at the beginning of the 5th month of life is usually too early and unnecessary. Most infants first start showing interest in food after the age of 5 months (3), so—in contrast to the authors' recommendation—there is no need to offer them supplements in the form of semisolid foods any earlier than that.

Owing to misinterpretation of the S3 guideline on allergy prevention, German pediatricians unfortunately often urge parents to start complementary feeding too early. More training courses not sponsored by producers of complementary foods would be desirable.

A postulated “window of opportunity” could not be confirmed. If babies continue to be breastfed on demand after introduction of complementary feeding, there are no nutritional/physiological objections to the complementary food being given in appropriately sized chunks (“baby-led weaning”) and the infants less frequently become overweight (4).

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Conflict of interest statement

The author declares that no conflict of interest exists.

More Information Required

We are delighted to see the publication of evidence-based data on infant nutrition and the epidemiological consequences of a shortened period of breastfeeding or no breastfeeding at all (1). However, we found no evidence with regard to two crucial aspects:

The authors state that follow-on formulae can be fed to infants that are already receiving complementary feeding. However, no evidence is provided to show that follow-on formulae, which in addition to lactose also contain glucose syrup and in some cases flavoring agents, are an adequate substitute for breast milk or for an infant formula with lactose as sole carbohydrate. From the point of view of metabolic programming and taste preferences, this recommendation is questionable to say the least. Indeed, the network “A Healthy Start in Life,” cited by the authors, describes feeding with follow-on formulae as “not necessary”.

Furthermore, the authors cite a commentary from the German Research Institute of Child Nutrition (*Forschungsinstitut für Kinderernährung*) as the sole source regarding the potential negative consequences of baby-led weaning (BLW). This source simply says that evidence remains to be supplied before BLW can be recommended as an alternative to classic semisolid feeding.

The network “A Healthy Start in Life” has proposed a compromise whereby chunky foods could be tried as an alternative if the child refuses mash (2).

With regard to the danger of aspiration in BLW, this topic has been discussed in the literature and it is recommended that the baby should be offered only soft steamed food, definitely no nuts (3).

In conclusion, we would like to express our gratitude to the authors for publishing this article, which underscores the importance of the World Health Organization's global recommendation for infant nutrition (breastfeeding alone for the first 6 months; in combination with age-appropriate complementary feeding up to the age of 2 years; and thereafter as long as mother and child wish) (4).

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In Reply:

We greatly appreciate the interest in our work expressed by the authors of the letters, and their positive comments. The purpose of CME articles in *Deutsches Ärzteblatt* is to present current knowledge on the chosen topic in compact form. Given the strict space limitation, it was not possible for us to explore all potentially interesting avenues in detail (1).

The protein content of human breast milk shows marked interindividual variation and decreases with the duration of breastfeeding. About 20 to 25% of the total nitrogen content is contributed by non-protein nitrogen. According to a recent meta-analysis, the median protein content (“true protein” without non-protein nitrogen) is 21 g/100 mL up to the 5th day of the infant’s life, 1.6 g/100 mL (approximately 2.4 g/100 kcal) between days 16 and 30, and 1.1 g/100 mL (ca. 1.7 g/100 kcal) from day 90 to day 360 (2). The proportion of functional proteins not absorbed and not metabolized by the child cannot be quantified precisely, but probably also varies between individuals and with the duration of lactation. The minimum protein content of infant formulae and follow-on formulae stipulated in European legislation currently is 1.8 g/100 kcal (3).

A great deal of evidence has now accumulated to support the broad consensus of professional bodies and institutions to the effect that the introduction of complementary feeding between the ages of 17 and 26 weeks is appropriate and may be beneficial for lowering the risk of allergy, as compared to later introduction (4–6). The benefit of suitable infant formulae based on protein hydrolysates for non-breastfed babies at risk of familial allergies for prevention of allergy and eczema is supported by many studies, meta-analyses, and Cochrane analyses and is not disproved by a single

meta-analysis with questionable methods (4, 5, 7). Older infants can of course pick up suitable pieces of food and eat these by themselves. With regard to baby-led weaning, however, there are considerable doubts concerning suitability, safety, and an adequate supply of appropriate nutrients; therefore at this time strict baby-led-weaning cannot be recommended (4, 5).

Because of the current European law regarding infant and follow-on formulae, these two types of products are virtually identical in composition. Different is the higher iron content of follow-on formulae (3). Flavoring agents are added neither to infant formulae nor to follow-on formulae. Non-breastfed infants between 7 and 12 months of age can by all means receive follow-on formulae, thus benefiting from the higher iron content without sacrificing any of the advantages of infant formulae (4, 5).

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Conflict of interest statement

Prof. Koletzko has received reimbursement of travel and accommodation costs and honoraria for scientific training courses from manufacturers of dietetic products (Danone, DGC, Hochdorf, Mead Johnson, and Nestlé). He has received material funding for a research project of his own initiation from Abbott, Danone, and Nestlé. Furthermore, he has received funding for the performance of clinical studies from manufacturers of dietetic products (Abbott, Danone, and Nestlé). As member of the National Breastfeeding Commission (Nationale Stillkommission), Prof. Koletzko tends to favor breastfeeding.

Dr. Prell has received honoraria for lectures from Hipp.