

BREASTFEEDING TO PREVENT DOUBLE BURDEN OF MALNUTRITION

Sirinuch Chomtho

Department of Pediatrics, Chulalongkorn University, Bangkok, Thailand

The double burden of malnutrition means under- and over-nutrition in the same country. Contrasting global trends in child stunting and overweight are found in the percentage and number of children under age 5 years who are moderately or severely stunted and who are overweight (UNICEF and WHO, 2012). There is now a decreasing slope for children who are small, but at the same time and in the same setting children are too heavy. The data on nutritional status of Thai children under 5 years old from the 4th National Health Examination Survey revealed a falling percentage of children in the groups of stunting (from 9.7% to 6.3%) and underweight (from 12.9% to 4.8%) (Office of National Health Examination Survey, 2010). There is, however, an increasing percentage of children who are overweight and obese, increasing from 5.8% to 8.5% over the past twenty years. This is another example of the double burden of malnutrition.

Breastfeeding rate in Thailand

One answer to tackle the problem of obesity is breastfeeding. The year 2013 saw the launch of the graphs indicating the ideal infant and young child feeding (IYCF). They advocate exclusive breastfeeding until six months, after which adding in complementary food to two years. The information shows that within ASEAN, Malaysia and the Philippines are performing

well in terms of breastfeeding.

For Thailand, the figure for exclusive breastfeeding has been and continues to be low. However, in combination with other food, such as herbal tea, water and other milk, there is a slight improvement. The majority falls within the breast with formula and early complementary feeding. UNICEF reported according to the Multiple Indicator Cluster Survey (MICS) for Thailand a 5.4% rate of 6-month exclusive breastfeeding in 2006 and 15% in 2011 (UNICEF, 2014). In order to expand the practice, the Ministry of Public Health introduced a campaign nearly a decade ago to encourage more breastfeeding. The Baby Friendly Hospital Initiative has a commendable result of over 80% breastfeeding within the first hour of birth. Exclusive breastfeeding until six months to date in Thailand is only around a quarter of the total.

Despite the common misconception, a breastfed baby actually grows faster in the first four to six months, then slows down but becomes leaner than the formula fed one does by the end of the first year. This pattern therefore explains the weight deviation from standard growth chart, particularly if the chart was devised from the mixed formula and breastfed populations. This is why the WHO Child Growth Standard 2006 has been developed. The database consists of babies who were exclusively

breast-fed for the first six months from both developing and industrialized countries. Standard here means “how the baby should grow, and not the way the baby is growing” (WHO, 2006).

In keeping with the development of child health at the global level, the Thai Ministry of Public Health has proposed to adopt the 2006 WHO growth chart in the near future. The past work in Thailand indicates that after this change, there will be more children detected with stunted growth, but those with what would be low weight will fall within the normal range.

It is important to ensure that mothers are not malnourished. Breast-milk composition on the whole is not influenced by maternal diet with the exception of some elements, including fatty acid, iodine, and water- and fat-soluble vitamins. Production of breast milk is robust. Breast milk still contains protective factors regardless of a mother's eating habits. An exclusive breastfeeding mother needs extra energy of 500 kcal per day, protein 15–25 g per day, and adequate water. She must be on guard against the lack of vitamin B group and vitamin D, as well as calcium, phosphorus, iron, zinc, folate, and iodine.

For Thai women at a reproductive age, pregnant, or lactating, the government encourages supplementary iron, folate and iodine. Ideally, multiple micronutrients supplement should be supplied. From 6 months onward, a baby needs complementary food. The percentage of energy derived from breast milk decreases as that from complementary food increases in infants aged birth to two years (Fig 1) (Dewey and Brown, 2003).

Breastfeeding and iron deficiency anemia (IDA)

A study in 2005 suggested that the incidence of iron deficiency anemia in Thai breastfed infants is higher than that of formula-fed ones (Tantracheewathorn and Lohajaroensub, 2005). Moreover, if the nutrient in complementary feed is improper, then there is an eleven times higher chance of developing IDA in the baby. When iron supplementation is given to curb IDA in breastfed infants, it is worth bearing in mind that only the ferritin level rises and not the hematological indices (Ziegler *et al*, 2009).

How do we prevent iron deficiency in Thai infants?

The crucial steps needed to be taken focus largely on the prevention of maternal iron deficiency and anemia during pregnancy. Delayed cord clamping, screening infants at risk, and providing iron supplementation all make a difference. In addition, food fortification and advocating for foods high in iron content are also helpful, if not essential. Food-based Dietary Guideline (FBDGs) for infants and young children is within the pages of the pink Thai Child Health Record book (Fig 2). There are photos promoting breastfeeding, together with the drawings of recommended complementary food.

The long-term effect of breastfeeding in obesity prevention

The potential protective effects of breastfeeding on later obesity may be explained by modulating child behavior, and early growth and substrate supply. When compared to formula-fed baby, the breastfed infant has a different suckling pattern, higher suckling frequency, and greater degree of control on meal size

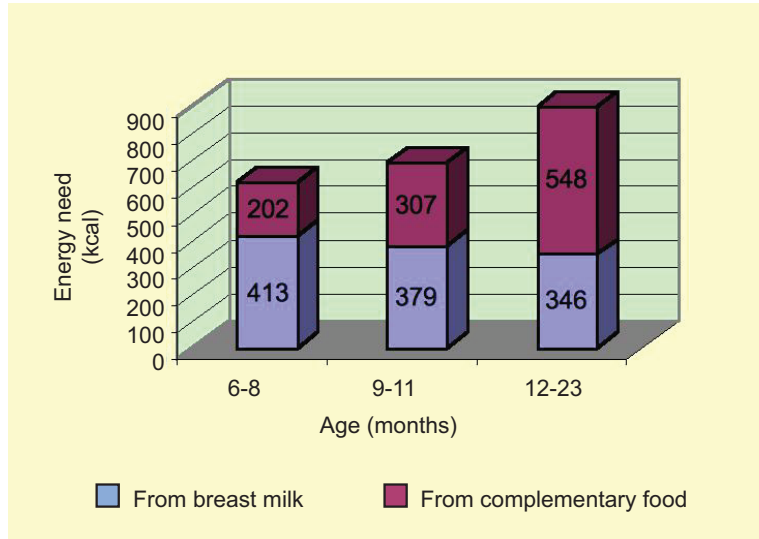


Fig 1–Energy need from complementary food in infants aged 0-2 years.



Fig 2–Food-based Dietary Guideline (FBDGs) for infants and young children is within the pages of the pink Thai Child Health Record.

and interval. Breast milk itself possesses a variety of tastes and smells that influence different food selection and dietary habits in later life. With early growth and substrate supply, breast milk contains lower average calorie density and protein intake per kg bodyweight, leading to slower growth rate in the first year.

There are three current theories on leptin, ghrelin and early protein intake that favor the breastfed baby to be of normal weight (Savino and Liguori, 2008; Koletzko *et al*, 2009). Breastfed infants are believed to have a higher level of leptin than formula-fed counterparts. The satiety signal, food intakes and adiposity are better controlled as a result. Serum ghrelin increases appetite. Formula-fed infants show a positive correlation between serum ghrelin and fasting time. Larger amounts of protein intake also occur in formula-fed infants. This increases the insulin releasing amino acid, which in turn stimulates insulin and insulin-like growth factor 1 (IGF1). Consequently, both rapid weight gain and adipogenic activity ensue. In 2013, WHO published a systematic review on the long-term effects of breastfeeding. The pooled OR in 16 large, high quality studies was 0.88 (95% CI: 0.83-0.93), signaling a weak but significant effect on obesity prevention (Horta and Victora, 2013).

Breastfed baby with adequate lactation support should have 'ideal growth,' but the exclusive breastfeeding rate still needs improvement. In addition, maternal nutrition is important to optimize the benefit of breastfeeding, and a good complementary feeding is still essential to address some problematic nutrients, for example, iron. We hope that the adoption of WHO Growth standards will take place in Thailand.

REFERENCES

- Dewey KG, Brown KH. Update on technical issue concerning complementary feeding of young children in developing countries and implication for intervention programs. *Food Nutr Bull* 2003; 24: 5-28.
- Horta BL, Victora CG. Long-term effects of breastfeeding: a systematic review. Geneva: World Health Organization, 2013: 74 pp.
- Koletzko B, von Kries R, Monasterolo RC, *et al*. Infant feeding and later obesity risk. *Adv Exp Med Biol* 2009;646:15-29.
- Office of National Health Examination Survey, Health System Research Institute, Thailand. Report of the fourth Thailand Health Examination Survey: 2008-9. Child Health (in Thai). Bangkok: Office of National Health Examination Survey, 2010.
- Savino F, Liguori SA. Update on breast milk hormones. *Clin Nutr* 2008; 27: 42-7.
- Tantracheewathorn S, Lohajaroensub S. Incidence and risk factors of iron deficiency anemia in term infants. *J Med Assoc Thai* 2005; 88: 45-51.
- The United Nations Children's Fund (UNICEF). UNICEF Data: Monitoring the situation of children and women [Internet]. New York City: UNICEF, 2014. [Cited 2014 Jul 18]. Available from: URL: <http://data.unicef.org/nutrition/iycf>
- UNICEF, WHO. UNICEF-WHO-The World Bank: 2012 Joint child malnutrition estimates - Levels and trends. Geneva: WHO, 2012. [Cited 2014 Jun 10]. Available from: URL: <http://www.who.int/nutgrowthdb/estimates2012/en/>
- World Health Organization (WHO). WHO child

growth standards [Internet]. Geneva: WHO, 2006. [Cited 2014 Jul 18]. Available from: URL: <http://www.who.int/childgrowth/en/>

Ziegler EE, Nelson SE, Jeter JM. Iron supplementation of breastfed infants from an early age. *Am J Clin Nutr* 2009; 89: 525-32.