

FOLLOW-ON FORMULA - A USEFUL STEP FORWARD IN THE MANAGEMENT OF IRON DEFICIENCY ANAEMIA?



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Follow-on formulas have been on our supermarket shelves for over 20 years, becoming a household norm. Approximately 69 percent of UK infants over eight months are now being fed follow-on formula (1). Infant formula manufacturers have developed their product ranges to include a standard 'first' milk, a 'follow-on' milk and more recently a 'toddler' milk, in order to meet the changes in infant nutritional needs over the first two years of life. The extensive range of infant formulas available today can create much confusion and anxiety amongst parents and health professionals. Choosing an appropriate formula is not only key to infant growth and development, but to ensuring overall nutritional adequacy.

Follow-on formulas were initially developed by manufacturers in response to the 1988 DHSS report on infant feeding practice, which recommended that until the age of 12 months breast milk or infant formula should be continued as the child's main drink (2). It had previously been recommended that this should only continue until six months of age. The trigger for this change came as prevalence of iron deficiency anaemia in the second year of life was highlighted as a growing concern. Prior to this change in infant feeding recommendations, it was common practice for cows' milk to be introduced after six months as the child's main drink. The early introduction of cows' milk is now well known to be detrimental to a child's iron status due to its low iron content (3). The development of iron rich follow-on formulas became manufacturers' answer to this problem.

See Table 1 for a comparison of the average nutritional content of cows' milk compared with breast milk and follow on formulas (*).

Follow-on formulas provide over 50 percent more iron than standard formula and this contributes significantly to overall iron intakes for infants of weaning age, which is six months or above (5). For example, a six-month old infant would meet their

daily requirement for iron by taking approximately 500ml per day of follow-on formula. An infant of this age taking standard formula would need over 800ml per day to meet requirements. Many paediatric dietitians will argue that if an infant is weaning well and having an adequate diet, then a follow-on formula is not necessary. However, data from the Infant Feeding Survey (IFS), 2010 (1), highlights that the weaning process can often be a window of poor iron intake for infants below 12 months of age. This is partly due to the low iron content of foods given at this time and feeding difficulties when introducing solids. Homemade first stage weaning foods often contain small amounts of iron as they are usually fruit or vegetable based. Commercial baby foods are now frequently iron enriched, unless they are organic products, as manufacturers acknowledge that iron stores in children of weaning age are limited. The IFS, 2010, states that approximately 38 percent of four- to six-month old babies are given commercial baby foods which may or may not be fortified with iron. Other weaning foods reported to be given have low iron content: for example, baby rice and fruit puree. Only 28 percent of infants are given homemade food at four to six months. At eight to 10 months of age, fruit and vegetables are still a

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Table 1: Average nutritional comparison of standard, follow-on and toddler milk formula with breast milk and cows' milk

Per 100ml	Standard formula (first milk)	Follow-on formula (From 6 months)	Toddler milk (From 12 months)	Breast milk (4)	Cows' milk (4)
Energy (kcal)	66-67	67-70	66-67	67-69	66
Protein (g)	1.3-1.4	1.4-1.5	1.4-1.5	1.3-1.5	3.2
Iron (mg)	0.24-0.53	1-1.2	1.2	0.07	0.05
Calcium (mg)	42-60	50-73	78-86	25-34	115

(*) Comparison made using the average nutritional content of SMA 1, 2 and 3 formula, Aptamil 1, 3 and Growing up formula, Cow and Gate 1, 3 and Growing up milk (1-2 years) formula and HiPP Organic Combiotic 1, 3 and 4 formula. (Information correct when accessed online on 18/12/12.)

Table 2: RNI for iron (0 - 3 years) (6)

Age	Iron (mg/d)
0-3 months	1.7
4-6 months	4.3
7-9 months	7.8
10-12 months	7.8
1-3 years	6.9

significant part of the diet. The intake of commercial baby foods, however, increases to 45 percent, with 70 percent of infants taking homemade foods. This is consistent with the 2010 SACN: Iron and Health report (5), which states that for the majority of older infants iron intake is obtained from 'family foods'.

It is only once weaning is established and protein and fortified cereal foods are introduced, that iron intake from the diet significantly increases. The majority of iron consumed by infants aged between six to 12 months is non-haem rather than haem (5). The introduction of haem iron sources can be a challenge. This has been reported by parents, with up 37 percent of infants experiencing problems with second stage weaning foods which are more textured, often containing protein foods such as red meat (5). This is consistent with my own experiences in practice where referrals from health visitors and other health professionals are frequent enough to warrant the development of a regular specialist clinic for these cases.

According to WHO statistics (5), the prevalence of iron deficiency anaemia in the general population could be as much as six percent, with children aged one and a half to two and a half years of age being one of the 'at risk' groups. The 2010 SACN report (5) also highlighted that data on average intakes of iron, nationally and internationally, was scarce. However, it reports that a study by Mills and Tyler, 1992 (7), conducted in 1986, found that average iron intake for infants aged between nine to 12 months was approximately 6.7mg/day; much lower than infants aged six to nine months, who managed up to 9.3mg/day. Table 2 shows the paediatric reference nutrient intake (RNI) for iron. It would be useful to have data which is more up to date on paediatric iron intakes, but this study demonstrates that infants were not meeting their requirements for iron. We

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can only assume that this is still the case, as iron deficiency anaemia is a problem for many toddlers, despite iron enriched follow-on formula being available and regularly being used.

As enlightening as the evidence and statistics are, they do not answer the big question: Is the use of an iron enriched follow-on formula the best way to prevent iron deficiency in children of weaning age?

Despite the lack of a definitive answer, the use of follow-on formula helps to significantly increase the iron content of the infant diet. Without it, there is the potential for rates of iron deficiency anaemia to be much higher. In 1996, Daly et al (8) found that use of follow-on formula reduced the risk of iron deficiency in 'at risk' infants and children. Using iron enriched follow-on formula gives parents reassurance that their infant's iron requirements are being met, even if the weaning process is not going as smoothly as it could. The provision of appropriate weaning advice should be available to parents with infants of weaning age and iron rich weaning foods from six months should be fully encouraged. However, as the evidence in this article has demonstrated, this is not always enough and problems do occur. The introduction of follow-on formula should definitely be considered if the weaning process is delayed and iron rich foods are not on the menu yet.

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Questions relating to: *Follow-on formula – a useful step forward in the management of iron deficiency anaemia?*
 Type your answers below and then **print for your records**. Alternatively print and complete answers by hand.

Q.1	Follow-on formulas were developed by manufacturers in response to what?
A	
Q.2	Why is cows' milk no longer considered suitable as an infant's main drink?
A	
Q.3	Give an example of how follow-on formula can contribute to iron intake in infants of weaning age.
A	
Q.4	What relevant data came out of the Infant Feeding Survey of 2012 regarding weaning?
A	
Q.5	What are the main reasons for a significant increase in iron intake in a child's diet?
A	
Q.6	What is the RNI for iron in infants aged 10-12 months and is this the true average intake?
A	
Q.7	How much iron is in follow-on formula (from six months) compared to cows' milk?
A	
Q.8	When should follow-on formula be considered in an infant's diet?
A	

Please type additional notes here . . .