

Lactose-free infant milks

Key points

There are three lactose free infant milks available over the counter in the UK. One is marketed as a food for special medical purposes and the others are marketed as infant formula. Confusingly this now means that one product must include on the label that it is to be used under medical supervision, whilst the others do not have to state this by law.

Primary and congenital lactose intolerance are clinical syndromes which can cause abdominal pain, diarrhoea, flatulence and/or bloating after ingestion of food containing lactose. These conditions are very rare in infants and require treatment with lactose-free infant formula under medical supervision.

Secondary lactose intolerance following a bout of gastroenteritis is usually temporary and there is no evidence that lactose-free milk is beneficial in these cases. Lactose free milks use glucose syrup as the source of carbohydrate. Glucose syrup has the potential to cause dental caries and so parents and carers using these milks are advised to take special care with cleaning their baby's teeth and to avoid prolonged contact of milk feeds with their baby's teeth.

There may be further risks associated with using a lactose free milk as diets without lactose may have disadvantages for the composition of the infants' colonic microflora and colonic physiological function, and may compromise calcium absorption.

Some lactose free milks are listed in the British National Formulary for Children which theoretically means that they are available on prescription, however, lactose free milks are also widely available for sale over the counter in supermarkets and pharmacies and they are rarely prescribed.

Lactose free milks are nutritionally complete and suitable for use from birth. They are based on cows' milk protein but the carbohydrate source, lactose, is replaced by glucose syrup or glucose syrup and maltodextrins.

Lactose intolerance is a clinical syndrome which can cause abdominal pain, diarrhoea, flatulence and/or bloating after ingestion of food containing lactose. The underlying physiological problem is lactose malabsorption, which is caused by an imbalance between the amount of lactose ingested and the capacity of the enzyme lactase to hydrolyse it, therefore the amount of lactose that can cause symptoms varies (Heyman et al, 2006).

Different types of lactose intolerance have been identified:

Primary lactose intolerance is caused by an absolute or relative lack of the enzyme lactase and is the most common cause of lactose malabsorption. It is extremely rare in infants.



Secondary lactose intolerance results from injury to the small bowel and is likely to be temporary.

Congenital lactase deficiency is a rare condition in infants, in which the infant develops persistent diarrhoea as soon as any lactose, from human milk or formula, is introduced.

Developmental lactase deficiency is observed among premature infants. Lactase production is deficient in the immature gastrointestinal tract until at least 34 weeks' gestation.

In the very rare cases of primary or congenital lactose intolerance, lactose-free formula is necessary, but these should be used under medical supervision. Where pre-term infants have developmental lactose intolerance, the continued use of breastmilk does not seem to have any adverse effects (Shulman et al, 1995).

In developed countries, the use of lactose-free milks as a treatment for acute gastroenteritis has been shown to have no clinical advantage over standard lactose-containing formula (Kukuruzovic and Brewster, 2002). The most recent ESPGHAN guidelines for the management of acute gastroenteritis in children (Guarino et al, 2014) suggest that there is some weak evidence for the use of lactose-free milk for the treatment of acute diarrhoea in a hospital setting, but that the *routine use of lactose free milks in community settings is not recommended*.

Lactose-free milks are not recommended for the treatment of colic (NICE 2017).

It has been suggested that there may be some confusion amongst health professionals about the treatment of temporary lactose intolerance in infants. In a study conducted in 29 European countries, when doctors were asked, in a questionnaire, what they would recommend for an infant with acute diarrhoea, 36% said they would use normal lactose-containing infant formula, 35% would use lactose-free milk, and 19% would use a lactose and milk protein free product (Szajewska et al, 2000).

Potential risks associated with the use of lactose free infant formula

There are potential risks associated with the use of lactose free formula. Some evidence suggests that infants fed a lactose free formula will have higher blood glucose and some circulating amino acid levels after 120 minutes than infants fed standard infant formula, suggesting that lactose free formula may have a negative impact on the infant metabolism which require further investigation (Slupsky et al, 2017).

It has also been suggested that diets without lactose might have disadvantages for the composition of the infants' colonic microflora and colonic physiological function, and they might compromise calcium absorption (Ziegler & Fomon, 1983). Moreover, feeding lactose free diets from birth (for example, for preventive purposes), will cause false negative results of most neonatal screening tests for galactosaemia (Höst et al, 1999).

Lactose-free milk has a greater potential to cause dental caries than milks where lactose is the main source of carbohydrate. This is because the common replacement carbohydrate, glucose, is cariogenic (Bowen et al, 1997). It is therefore vital that parents using lactose-free



milk follow advice to avoid prolonged contact of milk feeds with their baby's teeth and ensure that they clean their baby's teeth after the last feed at night.

Labelling and marketing of lactose free infant formula

There are specific regulations governing the composition, labelling and marketing of infant milks. Lactose free infant milks should comply with the relevant current regulations governing either infant formula (for Aptamil Lactose Free and SMA LF) or FSMP (for Kendamil Medi+ Lactose Free)

You can find out more about these regulations by following the link to the regulations on this website.

Cost of lactose free infant formula

Some lactose free milks are listed in the British National Formulary for Children which theoretically means that they are available on prescription, however, lactose free milks are also widely available for sale over the counter in supermarkets and pharmacies and are rarely prescribed. This may be because the vast majority of lactose intolerance in infants is secondary and rarely requires a lactose free formula.

Lactose free milks are generally more expensive than standard infant formula and this price difference could have a negative impact on family food budgets. Lactose free infant formula that is classified as infant formula rather than FSMP can be purchased under the Healthy Start (England, Wales and Northern Ireland) and Best Start Foods (Scotland) schemes. For more information on current prices of infant formula follow the website link to costs.

References

Bowen W, Pearson S, Rosalen P, et al (1997). Assessing the cariogenic potential of some infant formulas, milk and sugar solution. *Journal of the American Dental Association*, **128**, 865-871.

Guarino A, Ashkenazi S, Gendrel D et al (2014) ESPGHAN and Nutrition/European Society for Pediatric Infectious Diseases: Evidence based guidelines for the management of acute gastroenteritis in children in Europe: Update 2014. *JPGN*, **59**, 1320-1325.

Heyman B for the Committee on Nutrition of the American Academy of Pediatrics (2006). Lactose intolerance in infants, children and adolescents. *Pediatrics*, **118**, 1279-1286.

Høst A, Koletzko B, Dreborg S, et al (1999). Joint Statement of the European Society for Paediatric Allergology and Clinical Immunology (ESPACI) Committee on Hypoallergenic Formulas and the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition. Dietary products used in infants for treatment and prevention of food allergy. *Archives of Disease in Childhood*, **81**, 80-84.

Kukuruzovic R, Brewster D (2002). Milk formulas in acute gastroenteritis and malnutrition: a randomised trial. *Journal of Paediatrics and Child Health*, **38**, 571-577.

Shulman R, Feste A, Ou C (1995). Absorption of lactose, glucose polymers or combination in premature infants. *Journal of Pediatrics*, **127**, 626-631.



Slupsky CM, He X, Hernell O, Andersson Y et al (2017). Postprandial metabolic response of breastfed infants and infants fed lactose-free vs regular infant formula: A randomized control trial. *Scientific Reports*, **7**:3640. DOI: 10.1038/s41598-017-03975-4.

Szajewska H, Hoekstra JH, Sandhu B, The Working Group on Acute Diarrhoea of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (2000). Management of acute gastroenteritis in Europe and the impact of the new recommendations: a multicenter study. *Journal of Pediatric Gastroenterology and Nutrition*, **30**, 522-527.

Ziegler EE, Fomon SJ (1983) Lactose enhances mineral absorption in infancy. *Gastroenterol Nutr*, **2**, 288–294