



## FOOD ALLERGY IN BREASTFED BABIES

**This article aims to cover common topics and questions related to food allergy in breastfed infants, including ways to support continuation of breastfeeding and practical considerations for managing this group of infants and families in a clinical setting.**

It is undisputed that breast milk is the optimal source of nutrition for infants and incurs a huge range of short- and long-term health benefits to both mother and baby. At present, within the UK, rates of breastfeeding remain comparatively low to other countries in Europe, with initiation rates of 81% dropping to 48% (any breastfeeding) at six to eight weeks,<sup>1</sup> and 34% (any breastfeeding) and <1% (exclusive breastfeeding) by six months.<sup>2</sup> Current UK Department of Health and Social Care guidelines continue to recommend exclusive breastfeeding for the first six months of life, and the World Health Organisation encourages ongoing breastfeeding to two years of age.

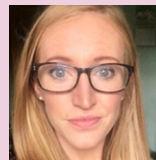
Food allergy development in breastfed babies, particularly those exclusively breastfed, remains uncommon, with cow's milk protein allergy (CMPA) in infancy quoted in the literature as having the highest incidence of infant allergies, at 0.5-1% in breastfed babies and 5-7% in formula-fed babies.<sup>3</sup> Incidence of CMPA in exclusively breastfed babies has, however, been quoted in other studies as being up to 2.2%.<sup>4</sup>

Rates of food allergy worldwide continue to rise however, and, in practice, it appears to be increasingly common to see mothers with concerns about potential food allergies in their breastfed infants.

### IS BREASTFEEDING PROTECTIVE FOR FOOD ALLERGY DEVELOPMENT?

The immunological complexity of breast milk is one of the many reasons why it will always remain the superior choice of nutrition for infants, with compounds within breast milk supporting not only passive immunity but also signalling and stimulating immune development.<sup>5,6</sup> The role of breastfeeding on infant immune system development and atopic disease potential (including food allergy) does, however, remain an area of the research base with conflicting evidence and outcomes – reflective of both the heterogeneity of studies to date, alongside the complexity of food allergy development.

Some studies have suggested that exclusive and prolonged breastfeeding can have a protective effect on atopy or allergy development, but, conversely,



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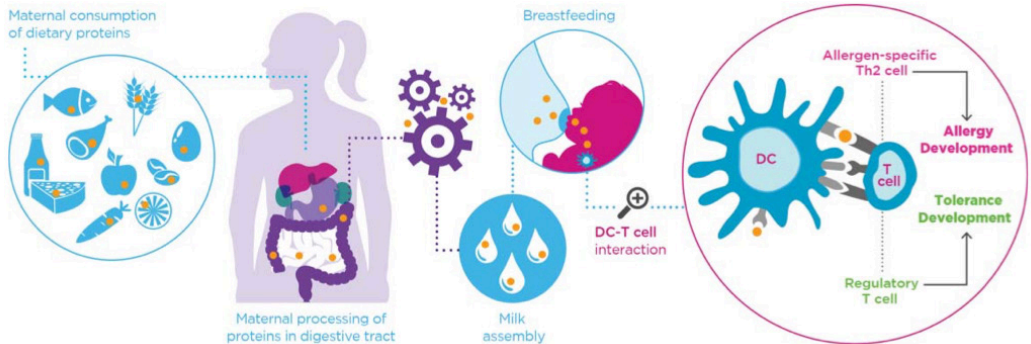
**Prof. Jon Vanderhoof and Rosemary Pauley**  
explore the role of the microbiome and probiotics in food allergy

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Figure 1: The maternal diet and the processing of the dietary proteins in the gastrointestinal tract determining whether an allergic or tolerogenic response will develop within an infant<sup>8</sup>



others have suggested breast milk is a contributor to early sensitisation to food allergens.<sup>5-8</sup> A recent systematic review and meta-analysis<sup>6</sup> has drawn the following conclusions based on the current evidence base, whilst acknowledging that data remains limited:

- Some evidence exists that breastfeeding is protective against wheezing within the first two years of life and for asthma development between 5-18 years, with longer duration of breastfeeding incurring some benefit for protection against asthma past five years of age.<sup>6</sup>
- Weak evidence exists for a protective effect of exclusive breastfeeding for eczema development in children up to two years of age, and allergic rhinitis development up to five years of age.<sup>6,7</sup>
- There is insufficient evidence or data to draw conclusions about the role of breastfeeding in prevention of or delay of the onset of specific food allergies.

### The bottom line

More evidence is needed to support conclusions regarding the role of breastfeeding and breast milk on possible food allergy prevention. However, some limited evidence exists regarding other atopic outcomes, including eczema, asthma and hay fever. There is evidence for food

allergens transferred via breast milk to support a tolerogenic effect (explored further see below). Breastfeeding is known to incur significant other benefits to immune function and development with infants.

### SHOULD MOTHERS CONSIDER ALLERGEN AVOIDANCE TO PROTECT THEIR BABY?

Many breastfeeding mothers raise concerns, often through hearsay and reflection on historic strategies of allergen avoidance during pregnancy and lactation, that consumption of certain food allergens can induce food allergies in their infant.<sup>9</sup> Anxiety can often present higher in mothers with food allergy themselves, or within a family with atopic predisposition. Given the U-turn in multiple facets of advice surrounding primary prevention of allergy over the past 20 years, their ambiguity is understandable.

The most up-to-date research in this area identifies a lack of evidence supportive of maternal dietary restriction during breastfeeding (and pregnancy) to prevent food allergy.<sup>7</sup> In fact, there is an increasing suggestion that exposure to food proteins via breast milk can support a tolerogenic effect for those allergens.<sup>7,9</sup>

Given that we do know a small percentage of babies do go on to develop allergic manifestations when breastfeeding, it is important to consider that an infant's immune response to allergen

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# The role of the microbiome and probiotics in CMA

Prof. Jon Vanderhoof and Rosemary Pauley explore the role of the microbiome and probiotics in food allergy

Research suggests the interaction between the microbiome and the mucosal immune system plays a significant role in the prevention and development of food allergy.<sup>1</sup> Probiotics can alter the microbiome and regulate the immune system.<sup>2</sup>

## LGG® is a unique strain clinically proven to alter the microbiome in your CMA patients<sup>2</sup>

- Improves the mucous layer of the lumen encouraging proliferation of beneficial bacteria<sup>3</sup>
- Facilitates the development of oral tolerance to dietary antigens at an earlier age compared to other formula in infants with CMA<sup>\*2</sup>

## Managing CMA early may:<sup>4</sup>

- Reduce the risk of developing future allergic manifestations later in life (known as the Allergic March)
- Positively impact the long-term health of the child



Find out more about the role of the microbiome and probiotics in CMA and the benefits of LGG®

**CMA**; cow's milk allergy, **LGG®**; *Lactobacillus rhamnosus* GG®.

**REFERENCES** 1. Fieten KB, et al. *Int Arch Allergy Immunol.* 2018 Jan 25;175(1-2):77–84. 2. Canani RB, et al. *ISME J* 2016;10:742–50. 3. Canani RB et al. *Clin Epigen* 2015;7:38. 4. Lumia M, et al. *Pediatr Allergy Immunol.* 2015 Dec;26(8):789–96.

**IMPORTANT NOTICE:** Breastfeeding is best for babies. The decision to discontinue breastfeeding may be difficult to reverse and the introduction of partial bottle-feeding may reduce breast milk supply. The financial benefits of breastfeeding should be considered before bottle-feeding is initiated. Failure to follow preparation instructions carefully may be harmful to your baby's health. Parents should always be advised by an independent healthcare professional regarding infant feeding. Products of Mead Johnson must be used under medical supervision. Trademark of Mead Johnson & Company LGG © 2020 Mead Johnson & Company, LCC. All rights reserved. LGG® and the LGG® logo are registered trademark of Chr. Hansen A/S.

Table 1: Time after ingestion to detection in breast milk<sup>13-17</sup>

Food protein example	Ingestion to detection time
Milk	From <3hours to up to 7 days
Egg	Up to 8 hours
Wheat	From 2 hours up to 3 days
Peanut	Between 2-6 hours

exposure via breast milk has been suggested to be affected by the following factors:<sup>7,8</sup>

- maternal allergen exposure and maternal immune response;
- genetic factors and environmental factors, eg, nutrition/nutrients, health status, gut microbiome (maternal and infant).

Interaction of these factors may play a role in determining induction of tolerance vs allergy development. Figure 1 above is a helpful way of exemplifying this.

#### HOW DO BABIES REACT TO FOOD ALLERGENS VIA BREAST MILK?

Put simply, a baby's immune system reacts to dietary antigens, which are excreted (leaked) in breast milk. Whilst human milk proteins in breast milk fall within a mg/ml concentration, food antigens derived from the maternal diet have been found in concentrations of up to 1000 x lower.<sup>11</sup> Detection of certain food-specific proteins in breast milk, such as  $\beta$ -lactoglobulin or ovalbumin, identifying milk and egg proteins respectively, confirms their presence within breast milk. It is now well established, although not always widely recognised, that such food proteins pass into breast milk in quantities sufficient enough to induce allergic IgE- or non-IgE-mediated symptoms in infants.<sup>12</sup> On the whole, most infants present within non-IgE-mediated allergic symptoms, but it is important to recognise that in a very small proportion of infants, a more severe presentation, including Food Protein-Induced Enterocolitis Syndrome (FPIES), can still occur.

#### WHAT ARE THE MOST COMMON FOOD ALLERGENS FOUND IN BREAST MILK?

Milk, egg, soya and wheat proteins are all acknowledged to be common food antigens present in breast milk, with milk protein recognised as the most common culprit for eliciting allergic reactions. These food proteins

have been found to present within hours and days in breast milk after ingestion, with some significant variability in the studies so far and depending on the food protein present.<sup>13-17</sup> See Table 1.

Theoretically, maternal gastrointestinal transit time may also play a role too, given variability in digestion factors, eg, meal consumed, bowel habits and, thus, potential time to expression in breast milk.

It is also important to acknowledge that whilst the four allergens in Table 1 are those predominantly studied, it is likely that other food proteins are also passed into breast milk, with the potential to induce an allergic response.

Certainly, in practice, the use of a robust allergy focused history, alongside a food and symptom diary, is essential to support detection of suspect allergens and appropriate allergy management, as it is not uncommon for mothers to have commenced multiple dietary exclusions due to concerns about allergies.

#### DIETETIC MANAGEMENT OF SUSPECTED FOOD ALLERGY IN A BREASTFED BABY

Similarly, to any other suspected cases of food allergy in babies or children, the cornerstone to diagnosis is completion of a robust allergy focused history. This should pull together information on:

- symptom history and suspected allergen/s;
- personal and/or family history of atopic disease;
- age of symptom onset, speed of onset, duration of symptoms and severity;
- frequency of occurrence, including reproducibility of symptoms;
- any current treatment measures inducing current exclusions (and impact of these), or management of co-existing atopic conditions such as eczema;
- feeding history;
- thorough assessment of maternal diet.

There are however unique challenges that present in picking apart a history with a breastfed baby, including:

- possibility of delayed expression time of food allergens in milk and, thus, ambiguity with culprit food allergen – a detailed food diary can be very supportive in such cases;
- the potential that a mother has already excluded multiple suspected food allergens already – thus, a process of well-planned individual reintroduction needs consideration and planning;
- differential diagnosis – symptoms can be challenging to pick apart, as many can overlap with both normal breastfeeding behaviour, or other breastfeeding, or medical challenges including maternal oversupply of milk, fast let down, tongue tie, shallow latch, gastrointestinal infection and transient lactose intolerance.



Following assessment, unless there are clear IgE-mediated symptoms evident that may warrant further supportive investigations such as skin prick or specific IgE testing alongside ongoing exclusion, supporting diagnosis of non-IgE-mediated food allergy requires a period of two to four weeks of maternal dietary exclusion of the suspect allergen, followed by reintroduction, whilst monitoring symptoms carefully. It is important to emphasise with mothers not only the importance of excluding one allergen at a time if there are concerns about multiple food triggers, but also adhering to the reintroduction phase in order to prevent misdiagnosis. This process should always be supported by a dietitian who is also able to ensure infant and maternal nutritional status is preserved or managed further as required, alongside guiding allergy management.

#### **IF A BABY REACTS TO A FOOD ALLERGEN DURING COMPLEMENTARY FEEDING, SHOULD MOTHERS EXCLUDE THIS FROM THEIR DIET?**

This is a common query or concern raised from breastfeeding mothers who experience the initiation of allergic symptoms in their infant upon commencement of weaning. In such cases, it is important to encourage and reassure mothers that they can and should continue to

consume that food allergen within their own diet, assuming there were no evident concerns about possible allergy prior to complementary feeding. As discussed above, the exposure to components of the food protein via breast milk may also go some way in supporting tolerance in the infant and this is often helpful information to share and discuss with parents to reassure them.

#### **SUPPORTING MATERNAL HEALTH WHILST BREASTFEEDING A BABY WITH FOOD ALLERGIES**

The literature and practice-based evidence alike highlight that breastfeeding an infant with one or multiple food allergies can have a significant negative impact on an (often exhausted) mother's mental and physical health, including nutritional status. For many, the challenges of and processes involved can also affect their motivation to breastfeed or perpetuate difficulties with breastfeeding, due to aspects such as stress levels and/or over dietary restriction. In supporting babies with food allergy, it is imperative to allow time to explore and support the mother with advice in the following areas:

##### **Nutritional health**

Support with maternal nutritional requirements whilst breastfeeding is an important consideration given the fact that energy, protein and multiple nutrients are required in increased quantities during breastfeeding but may also be compromised due to dietary restrictions. Guiding on key principles of a healthy balanced maternal diet, optimising energy, protein

and micronutrient intake, is key. In the case of certain nutrients, extra vigilance is often necessary. For example, an additional 550mg of calcium is required per day when breastfeeding (1250mg/day), which can be a challenge to meet for many mothers, but increasingly difficult if excluding milk for example. Often mothers require dietary advice alongside guidance with nutrient supplementation. Recent research has also identified that bone turnover in breastfeeding mothers may still be elevated despite supplementation with calcium,<sup>12</sup> again highlighting the role of holistic dietary management of the child and mother in cases of breastfed babies with food allergy.

### Mental health

Whilst poorly studied, it is undoubtable that managing suspected or confirmed food allergy in breastfed infants can place a significant burden on mothers and families, negatively impacting quality of life – often at a very fragile time for maternal mental well-being anyway. Psychological factors around feeding (eg, perceiving breast milk

as ‘doing harm’), managing dietary changes, coping with baby’s diagnosis and all alongside being a new parent, can place significant stress on mothers. If you have concerns regarding a mother’s mental wellbeing, consider carefully raising the discussion during consultations, signpost to supportive mental health charities, explore support structures and, as required, liaise with other professionals for support, including the GP and Health Visitor.

### Breastfeeding support

A number of mothers may experience, or anticipate challenges associated with continuing or maintaining breastfeeding in cases of food allergy. Healthcare professionals, including dietitians, should be proactive in supporting preservation of breastfeeding wherever possible and enlisting support for mothers as required from, for example, breastfeeding support champions, an International Board Certified Lactation Consultant (IBCLC), the National Breastfeeding Helpline,<sup>18</sup> the Association of Breastfeeding Mothers<sup>19</sup> and/or the La Leche League.<sup>20</sup>

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- <https://www.laleche.org.uk/>



Questions relating to: *Food allergy in breastfed babies*

*Type your answers below, download and save or print for your records, or print and complete by hand.*

Q.1	What Evidence exists to support breast milk as having a protective effect on the health of an infant?
A	
Q.2	Explain the factors that affect an infant's immune response to allergen exposure via breastfeeding.
A	
Q.3	How do babies react to food allergens via breast milk?
A	
Q.4	What food proteins detected in breastmilk can cause an allergic response in infants?
A	
Q.5	Outline other factors that can play a role in transit time.
A	
Q.6	Give four factors that should be included in an allergy focused history (AFH).
A	
Q.7	Outline two challenges that can make an AFH difficult to complete.
A	
Q.8	Explain why it is important to manage the nutritional health of the mother during breastfeeding.

Please type additional notes here . . .