Immunology and Allergy

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Nutrition and Dietetics

Fast Facts Information Sheet

Hydrolysed Rice Formula as a Management Option in Non-Breastfed Infants with Cow's Milk Allergy

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Hydrolysed Rice Formula as a Management Option in Non-Breastfed Infants with Cow's Milk Allergy

Cow's milk allergy (CMA) is a reproducible immune-mediated allergic response to one or more proteins found in cow's milk, its derivatives, and in other mammalian milks.[1] Breastmilk feeding is the ideal source of nutrition in infants with CMA and where not available a hydrolysed rice formula (HRF) may be considered as first-line feed.

Between 1.8% and 7.5% of children <4 years have a challenge-proven immunoglobulin E (IgE)-mediated CMA. According to the British Society of Allergy and Clinical Immunology, between 2–3% of children have this allergy, but clinicians should also consider that non-IgE-mediated allergy is more prevalent than IgE-mediated allergy in the UK.[2]

CMA is classified according to the underlying immune mechanism:

1. IgE-mediated
2. Non-IgE-mediated
3. Mixed IgE and non-IgE

- All milk proteins are potential allergens and polysensitisation to several proteins occurs in most patients.
- The 'major' milk allergens include α-, β-, and κ-casein, β-lactoglobulin, α-lactalbumin, and serum albumin.[1]

Presentation and Timing of Onset

CMA is the most common food allergy in infants in the UK.[3] Infants typically present with CMA in the first 6 months of life following exposure to cow's milk as formula, or later when complementary foods containing cow's milk are introduced.[2]

Presentation of symptoms may be immediate or delayed and in some cases mixed symptoms occur. A diagnosis is reliant on an allergy-focused history, skin prick, or specific IgE testing in IgE-mediated and in non-IgE-mediated CMA, and elimination diet followed by reintroduction with the reoccurrence of symptoms. The gold standard test for both is a supervised oral food challenge (OFC).

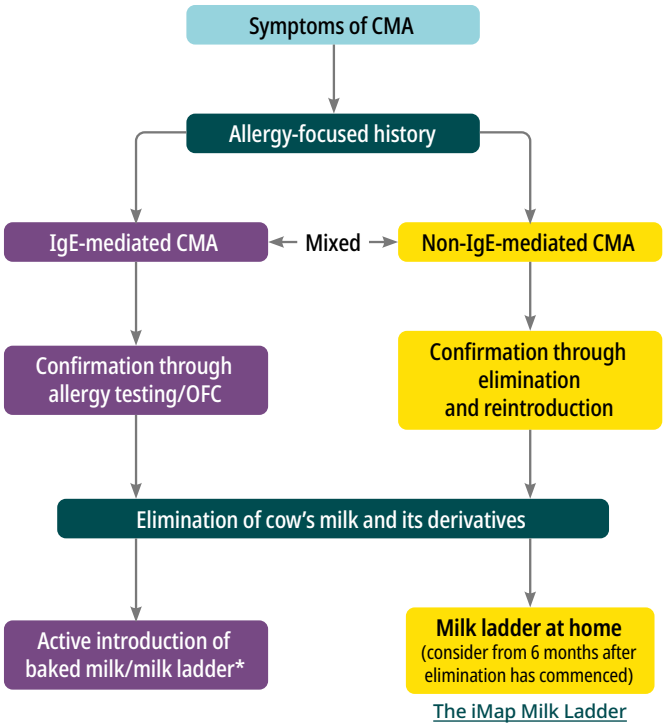
IgE-mediated CMA	Non-IgE-mediated CMA
Presents: within minutes and up to 1h after exposure to milk formula or dairy products	**Presents**: >2h and up to 3 days after exposure, but for FPIES symptoms can present 1–4h after allergen exposure
Cutaneous: urticaria, angioedema, eczema	**Cutaneous**: eczema
Digestive: vomiting, diarrhoea	**Digestive**: profuse/chronic vomiting, diarrhoea, abdominal pain/discomfort, constipation, rectal bleeding
Respiratory: rhinitis, cough, wheezing, stridor, dyspnoea	**General**: faltering growth, feeding difficulties and with eosinophilic oesophagitis (EoE) food impaction
Cardiovascular or neurological: pallor, dizziness, floppiness, hypotension, loss of consciousness	

General Management

- The management of CMA includes the complete avoidance of cow's milk and all mammalian milks (due to the protein homology) as drink or in food, while suggesting a suitable nutritious milk and food alternatives.
- Vitamin and mineral supplements should be considered, particularly calcium and vitamin D.[4]
- In recent years, a more active approach has been adopted for the management of CMA, which includes the introduction of baked milk and/or the milk ladder in young children.[5] This is based on data showing that baked milk/processed milk products have a reduced allergenicity and therefore may be better tolerated and support tolerance earlier.[5]
- The safety of home introductions using either baked milk or the milk ladder in IgE-mediated CMA should be considered together with an allergy-qualified HCP.

Supporting Breastmilk Feeding

Breastmilk is the ideal source of nutrition in infants with CMA. A maternal elimination diet of cow's milk/its derivatives is usually not required and HCPs should guard against an unwarranted elimination diet, which impacts on quality of life and nutritional status of the mother. If a maternal elimination diet of cow's milk/its derivatives is deemed appropriate then nutritional adequacy of the mother and calcium and vitamin D supplementation should be considered.[6]



The iMap Milk Ladder

* Prior to introducing baked milk or commencing the milk ladder, the child needs to be reviewed by an allergy-qualified HCP.

1 Jensen SA et al. *World Allergy Organ J.* 2022;15(9):100668.
2 Luyt D et al. *Clin Exp Allergy*. 2014;44(5):642-672.
3 Venter C et al. *Allergy*. 2008;63(3):354-359.
4 Meyer R et al. *World Allergy Organ J*. 2023;16(7):100785.
5 Meyer R et al. *J Hum Nutr Diet*. 2025;38(1):e13391.
6 McWilliam V et al. *World Allergy Organ J*. 2023;16(11):100830.

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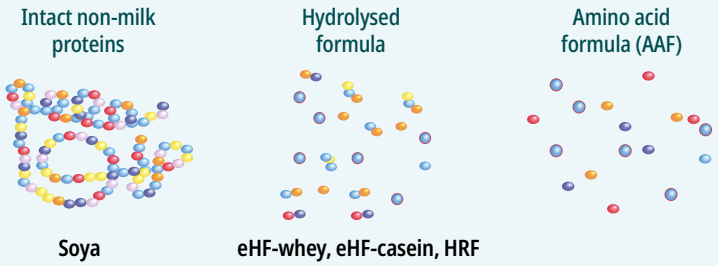
Suitable Milk Alternatives for Infants with CMA

Hypoallergenic formulas available in the UK must adhere to the regulatory guidelines of the Advisory Committee on Borderline Substances (ACBS) and to the European Food Safety Authority (EFSA) in the EU. All formulas suitable for the management of CMA have been assessed for both growth and tolerance.[7] Formulas should only be recommended if breastmilk is not available or where there is an expressed parental wish to commence on a formula.

- International guidelines suggest either extensively hydrolysed formula (eHF) or hydrolysed rice formula (HRF) as first-line feeds for most children with CMA.[7,8]
- Amino acid formulas (AAF) are only recommended for the most severe cases of CMA, including faltering growth, intolerance to eHF or HRF, or eosinophilic oesophagitis (EoE).[7,8]
- Soya formula is not recommended as a first option for CMA.[2]



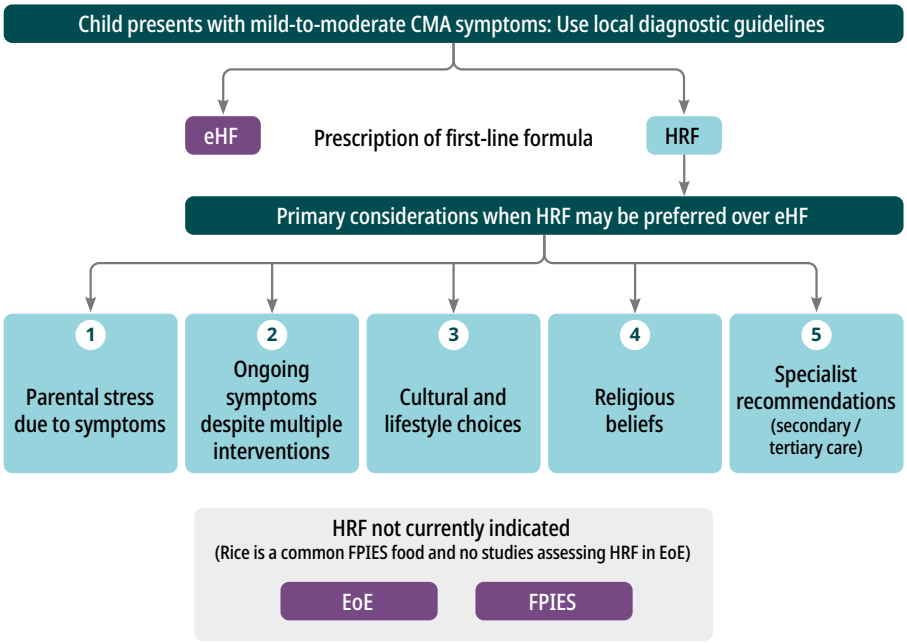
Research on Hydrolysed Rice Formula (HRF)

- HRF have been available in Europe for >20 years and assessed for supporting growth and as a management option for CMA.[7]
- HRF adhere to EFSA regulations for ingredients and are approved by ACBS for CMA in the UK. The nutritional composition, including amino acid profile and vitamin/mineral content, is similar to other formulas for CMA and can be used as a sole source of nutrition.
- HRF can be recommended as a first-line option for CMA, where available, as outlined in the DRACMA guidelines.
- According to ESPGHAN guidelines, HRFs may be considered an alternative option to eHF based on hydrolysed casein or whey for the management of CMA.[8]
- HRF are suitable for infants requiring a Halal, Kosher, or plant-based diet. (Note, some HRF contain ingredients that are not vegan: human milk oligosaccharides).
- If there is faltering growth (FG), most guidelines suggest an AAF, since AAF shows improved catch-up growth when compared to other formulas.[7]
- There is insufficient evidence to recommend HRF for EoE.[8]
- HRF is currently not recommended for food protein induced enterocolitis syndrome (FPIES) since rice is a common trigger for FPIES.[8]
- Studies show that the arsenic content in HRF is well below recommended levels and is therefore not a concern.[9]

When to Choose a HRF for CMA

- HRF, like other infant formulas, should only be suggested in children who are not breastfed or where there is a parental request for a formula.
- An HRF may be used in preference for eHF for the following reasons:

1. Unlike eHF, HRF are free of cow's milk protein, and may reduce risk of ongoing symptoms.
2. Many parents have tried multiple feeds by the time they see an HCP for CMA. As HRF is cow's milk protein free, it may reduce risk of further feed changes.
3. HRF are suitable for families on a plant-based diet for lifestyle/ environmental reasons.
4. HRF are Kosher, Halal, and vegetarian.
5. An HCP may decide that HRF is more suitable based on symptoms, previous growth history, and acceptance of feed.



7 Bognanni A, et al. *World Allergy Organ J*. 2024;17(4):100888.
8 Vandenplas Y, et al. *J Pediatr Gastroenterol Nutr*. 2024;78(2):386-413.
9 Meyer R, et al. *Pediatr Allergy Immunol*. 2018;29(5):561-563.

IMPORTANT: Breastfeeding is best for infants and is recommended for as long as possible during infancy.

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