

Inside the Tin

Part 1: A Guide to Infant Formula for the Management of Cow's Milk Protein Allergy

Nutritional support in early life is an essential part of the [clinical management](#) of infants with food allergies, such as cows' milk protein allergy (CMPA).

Breastfeeding is still recommended, sometimes it requires [exclusion of cows' milk from the mother's diet](#) but not always.¹ When breastfeeding is not possible or for mixed feeding, there are several different types of infant formulas available to manage CMPA. **How do you select the most appropriate one?**

Types of formula for management of CMPA

The Australasian Society of Clinical Immunology and Allergy (ASCIA) emphasises that while breast milk is the first choice for all infants including those with food allergies, a [specialised formula](#) is recommended for infants with confirmed CMPA when breastfeeding is not possible.¹ There are several different types of specialised formulas appropriate for managing infants with CMPA: hypoallergenic formulas including extensively hydrolysed and amino acid-based formulas and other plant-based formulas (soy, rice).^{1,2}

Hypoallergenic Formulas:

Hydrolysed formulas are based on extensively hydrolysed protein (e.g. cow's milk or rice) or free amino acids and data to support their safety/efficacy in CMPA. The American Academy of Pediatrics (AAP) defined a formula as hypoallergenic if it ensures with 95% confidence that 90% of infants with confirmed cow's milk allergy (CMPA) will not react with defined symptoms under double blind placebo-controlled conditions.³



Extensively hydrolysed formulas

[Extensively hydrolysed formulas](#) (eHF) have been treated with enzymes to break down most of the cows' milk proteins into smaller, hypoallergenic protein fragments. They are recommended by ASCIA as a first-choice treatment in mild to moderate cows' milk protein allergic infants (<6 months)⁴ and for most children, an eHF should be sufficient for symptom resolution.⁵ Around 10% of children with immediate-type IgE mediated CMPA will continue to react to eHFs and therefore an amino acid formula (AAF) will be required.⁵

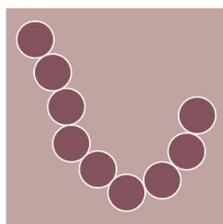
eHFs can be either extensively hydrolysed whey-based formulas or extensively hydrolysed casein-based formulas. Extensively hydrolysed whey-based lactose-containing formulas are more palatable and therefore thought to have better acceptance.⁶



Amino acid-based formulas

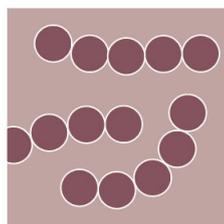
[Amino acid-based formulas](#) (AAF) are used in severe cases of CMPA and involve the complete history of the infant being assessed as it is the overall picture that will determine when an AAF is needed. Infants with eosinophilic esophagitis (EoE) or anaphylaxis will require an AAF as first-line management.^{1,5} Infants who are growth faltering, in particular with multiple food allergies, severe atopic dermatitis and/or gastrointestinal symptoms may also benefit from an AAF. When an eHF has been trialled and not tolerated then an AAF is recommended.^{1,5} Instead of being based on whole or broken-down cows' milk protein, these formulas are based on amino acids and are small enough to not be recognised as 'harmful' by the immune system.

Differences in allergenicity between formulas explained:



STANDARD INFANT FORMULA

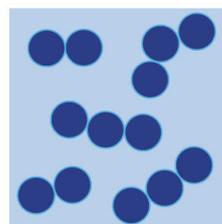
Intact cow's milk protein suitable for healthy infants that do not have CMPA requiring a partial or complete breast milk substitute.



PARTIALLY HYDROLYSED FORMULA (pHF)

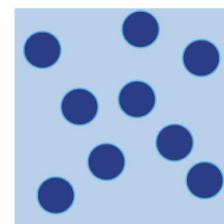
Intact cows' milk protein broken down into smaller partially hydrolysed protein chains. pHF are not appropriate for use in allergy management and do not reduce the risk of a high-risk infant developing an allergy.⁴

FACT: pHF are sometimes referred to as 'H.A.' (Hypo-allergenic), however these formulas are not suitable for the dietary management of CMPA.



EXTENSIVELY HYDROLYSED FORMULA (eHF)

Intact cows' milk protein broken down into smaller peptides (extensively hydrolysed) and therefore less likely to cause an allergic reaction. Extensively hydrolysed formulas are successful in symptom resolution in most children with CMPA.^{5,6}



AMINO ACID-BASED FORMULA (AAF)

Amino acids are protein in its simplest, completely broken down form. They are unlikely to bind to immune cells and therefore do not cause a reaction.⁷



Soy protein-based formulas

Soy infant formulas contain soy protein derived from soy flour.⁸ Soy protein-based infant formula is not recommended in the management of CMPA before 6 months of age and therapeutic formulas such as eHF or AAF (if indicated) should be used.^{1,8} Soy infant formula may be considered after 6 months but tolerance of soy protein should be established first by oral challenge.⁸



Rice protein-based formula

Rice protein-based formulas are based on hydrolysed rice and are considered an alternative formula to eHF or soy protein formula.¹ Rice protein-based formulas are supplemented with amino acids, to ensure adequate nutritional quality for infants.⁹ Due to the low allergenicity of rice and because there is no cross-reactivity between milk and rice proteins these formulas are considered a suitable option in the treatment of CMPA. Rice protein-based formula is not suitable if the infant is allergic to rice.⁹

Not a 'one size fits all' approach

Australian guidelines recommend that the type of specialised formula selected be tailored to the infant's age, severity, and type of allergy.¹ An overall history of the infant should be considered before the infant formula choice is made.^{1,5}

For an overview of the management guidelines for diagnosed CMPA, [read our article on Demystifying cows' milk protein allergy.](#)

According to ASCIA, infants allergic to both cows' milk and soy should continue to take specialised formula until 2 years of age.¹ Most plant-based milk replacement products unless fortified with calcium are too low in protein, fat and calcium and are therefore not nutritionally complete for children under 2 years of age unless under the guidance of a dietitian or health care professional.¹

Infant formula options that are NOT recommended for infants with CMPA are listed in the table below: ¹



- **Cows' milk-based**, including anti-reflux, lactose-free, organic, newborn and follow on
- **Partially hydrolysed cows' milk protein (pHP)** as they still contain cows' milk protein



- **Goat milk-based and other mammal-based milks** and formula (e.g. sheep) as the protein in these milks is similar to cows' milk.

ASCIA does not recommend **hydrolysed formulas (eHF or pHF)** for the [prevention of allergic disease](#).¹⁰

References:

1. ASCIA. Guide for Milk Substitutes in Cow's Milk Allergy. 2022. (Cited 2022 April 7th). Available from: <https://www.allergy.org.au/hp/papers/guide-for-milk-substitutes-cows-milk-allergy>
2. Kemp AS, Hill DJ, Allen KJ et al. Guidelines for the use of infant formulas to treat cow's milk allergy: an Australian consensus panel opinion. Med J Aust. 2008 Jan 21;188(2):109-12.
3. American Academy of Pediatrics. Committee on nutrition. Hypoallergenic infant formulas. Hypoallergenic infant formulas. Pediatrics. 2000; Aug;106 (2 pt 1) :346-9
4. ASCIA. Cow's milk (dairy) allergy. 2019 (cited 2022 April 7th). Available from: <https://www.allergy.org.au/patients/food-allergy/cows-milk-dairy-allergy>
5. Meyer R, Groetch M, Venter C et al. When should infants with cow's milk protein allergy use an amino acid formula? A Practical Guide. J Allergy Clin Immunol Pract. 2017
6. Maslin K, Fox A, Chambault M et al. Palatability of hypoallergenic formulas for cow's milk allergy and healthcare professional recommendation. Pediatr Allergy Immunol. 2018;29:857-86
7. Corkins K, Shurley T et al. What's in the bottle? A review of infant formulas. Nutr Clin Pract. 2016;31:723-729
8. Agostini C, Axelsson I, Goulet O et al. ESPHGAN Committee on Nutrition. Soy protein infant formulae and follow-on formulae: a commentary by the ESPHGAN committee on nutrition. Journal of Paediatric Gastroenterology and Nutrition. 2006 42:352-361
9. Dupont C, Bocquet A, Tome D et al. Hydrolysed rice protein-based formulas, a vegetal alternative in cow's milk allergy. Nutrients. 2020;12,2654
10. ASCIA. ASCIA guidelines - Infant feeding and allergy prevention. 2020 (cited 2022 April 7th). Available from <https://www.allergy.org.au/hp/papers/infant-feeding-and-allergy-prevention>