Breastfeeding in the presence of food allergies

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Live event date: September 20th, 2023 - *Recording on NutriciaLearningCenter.com*

Learning Objectives:

Explain the prevalence and different presentations of food allergy during exclusive breastfeeding.

Identify whether a maternal elimination diet is needed when breastfeeding a child with food allergies.

Assess the evidence around food allergen content in human milk.

Provide practical information on maternal elimination diets and supplemental formula if indicated.

Notes:

Nutricia North America supports the use of breast milk wherever possible.

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Breastfeeding in the presence of food allergies

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Nutricia's Pediatric Nutrition Masterclass
September 20, 2023

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Disclosures - Carina Venter

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In relation to this presentation, I declare the following, real or perceived conflicts of interest:

Type	Company
Research Grant (P.I., collaborator or consultant; pending and received grants)	Reckitt Benckiser Group
Speakers Bureau / Honoraria	Danone/Nutricia Abbott Reckitt Nestle Nutrition Institute HAL Allergy
Consultant / advisory board	Danone/Nutricia Abbott Reckitt Nestle Nutrition Institute HAL Allergy

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Objectives

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Objective #1:
Explain the prevalence and different presentations of food allergy during exclusive breastfeeding.

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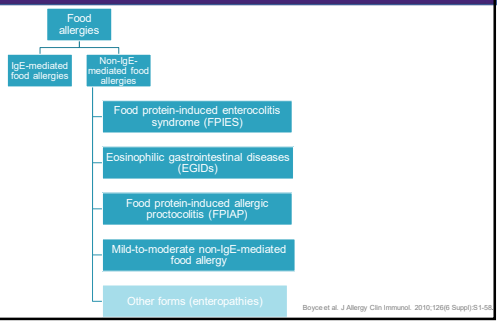
Different types of food allergy



IgE = Immunoglobulin E

Boyce et al. J Allergy Clin Immunol. 2010;126(6 Suppl):S1-58.

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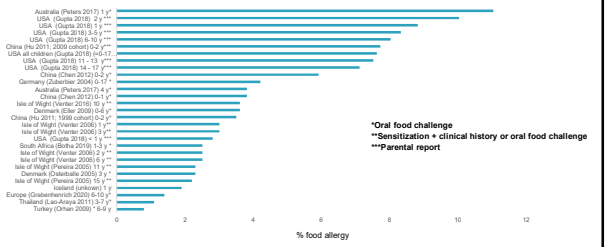
What is the current prevalence & impact of food allergies in infants & children?



Schroer and Venter. Immunoglobulin E–Mediated Food Allergies. In The Health Professionals Guide to the Management of Food Allergies. 2023. pp. 25 – 42.

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Cow milk allergy (CMA) in infants and children

- CMA represents about 10 – 50% of food allergies

Year	Country	Age (y)	Population (N)	Overall food allergy prevalence (%)	CMA (%)	Reference
2012	Philippines	14-16	11 434	-	-	Shek et al.
2016	Singapore	0-3	1152	1.1-3.1	**0.1-0.5**	Tham et al.
2012	Hong Kong	0-14	7393	4.8	**0.5**	Ho et al.
2014	Korea	0-6	16 749	3.7	**0.5**	Park et al.
2015	Europe	0-2	12 049	-	**0.5**	Schoemaker et al.
2011	Chongqing, China	0-1	477	3.8	**1.3**	Chen et al.
2001	Japan	0-6	101 322	5.1	**1.4**	Noda et al.
				~10		Ebisawa et al.
2015	Guangdong, China	1-7	2540	4	**1.9**	Zeng et al.
2008	UK	0-3	969	6	**2**	Venter et al.
2018	USA	0-18	38 408	7.6	**2.0**	Gupta et al.

Kim, et al. Int Arch Allergy Immunol 2020;181(2):103-1

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Prevalence of IgE-mediated food allergy during exclusive breastfeeding

Systematic review identified 32 studies

- 14 studies cow's milk proteins
- 9 egg
- 4 peanut
- 2 wheat
- 3 cow's milk and egg

Levels of all food proteins across the studies were much lower than the eliciting dose for 1% of allergic individuals (ED01) in most samples.

Probability of an IgE-mediated allergic reaction in a food-allergic infant breastfed by a woman consuming the relevant food can be estimated as **≤ 1:1000 for cow's milk, egg, peanut, and wheat.**

IgE = Immunoglobulin E

Gamrova et al. Journal of Allergy and Clinical Immunology: In Practice, 2022-05-01, Volume 10, Issue 5, Pages 1312-1324.e9

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Case studies identify a risk

- Anaphylactic reactions to human milk are rarely reported, and no estimates of the prevalence exist

4 month old	5 month old	5 day old

• Developed anaphylaxis after maternal ingestion of fish
• Urticaria, vomiting, cough, wheeze
	• Developed wheezing & urticaria after maternal ingestion of fish	• Bloody stools
		• Maternal, cow milk elimination diet x 3 days
		• Upon reintroduction the infant developed:
		  • Cyanosis
		  • Undetectable blood pressure
		  • Mucousy, bloody, loose stools
		  • Required resuscitation

- All cases show sensitization to the food
- Symptoms resolved in all cases upon maternal avoidance of the culprit food

1. Arima et al. Asia Pac Allergy. 2016;6:257-9. 2. Monti et al. Acta Paediatr 2006;95:1514-5. 3. Lifschitz et al. J Pediatr Gastroenterol Nutr 1988;7:141-4. 4. Rajani et al. J Allergy Clin Immunol Pract 2020;8:53-62

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Prevalence of food protein-induced enterocolitis syndrome (FPIES) during exclusive breastfeeding

COUNTRY	STUDY CHARACTERISTICS	NUMBER	FINDINGS
Australia	Population-based survey	240 infants and children	**5%** (n=11) acute FPIES while exclusively breastfed (milk, grains, chicken)
Japan	Clinical cohort	46 children	**6.5%** reacted during exclusive breastfeeding (rice and soy)
Israel	Birth cohort	64 children	**9.3%** presented with first FPIES reaction whilst breastfed
USA	Clinical cohort	16 children	**50%** presented with first FPIES reaction whilst breastfed
Italy	Clinical cohort	66 children	**95%** of children with FPIES were breastfed, but it is unclear if exclusively breastfed
Australia	Case study	1 infant	Infant; exclusively breastfed developed acute FPIES from maternal ingestion of a large amount of soy. This group reported that 21 breastfed infants with acute FPIES presented during breastfeeding, but not clear if they were exclusively breastfed.
USA	Case study	1 infant	Infant exposure to rice and sweet potato while exclusively breastfeeding
Italy	Case studies	2 children	Chronic FPIES caused by maternal cow's milk ingestion
USA	Retrospective study	160 children and adults	3 children presented with chronic FPIES while exclusively breastfed (cow's milk)

Groetch et al. Ann Allergy Asthma Immunol. 2021 Jul;127(1):26-32

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Prevalence of eosinophilic esophagitis (EoE) during exclusive breastfeeding

- There is a paucity of data in regard to allergens transferred via human milk and its impact on EoE.

One case study reports a child, symptomatic with EoE, whilst breastfed & mother consuming cow's milk products.

The child improved on a CM-free diet and amino acid-based formula after breastfeeding was discontinued.

Unclear if the EoE would have improved if the mother adhered to strict CM avoidance from her diet and if the symptoms of EoE presented whilst being exclusively breastfed.

CM = Cow's milk

1. Topal et al. Turk J Pediatr. 2013;55(2):222-225. 2. Meyer et al. Allergy. 2020 Jan;75(1):14-32.

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Presence of food protein-induced allergic proctocolitis (FPIAP) during exclusive breastfeeding

- Exact prevalence is unknown
- One of the more common non-IgE-mediated food allergies
- Common in breastfed infants
- Painless rectal bleeding, onset typically within the first months of life
- Thriving and well-appearing
- >20% also have eczema

Nowak-Wegrzyn, Katz, Mehr, Koletzko. J Allergy Clin Immunol. 2015.

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Prevalence of mild-to-moderate IgE-mediated food allergy during exclusive breastfeeding

Has not been studied.

Commonly seen in clinical practice.

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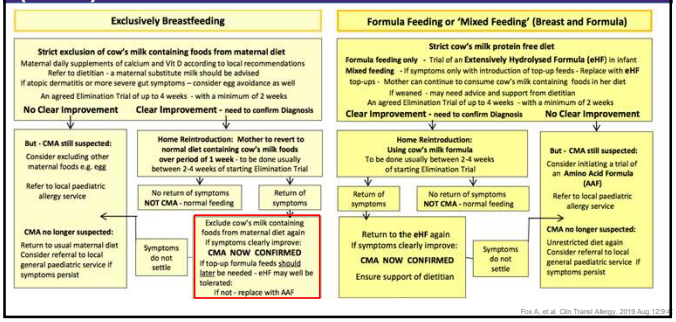
International Milk Allergy in Primary Care (iMAP) Guidelines



Fox A, et al. Clin Transl Allergy. 2019 Aug 12;9:

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Objective #2:
Identify whether a maternal elimination diet is needed when breastfeeding a child with food allergies.

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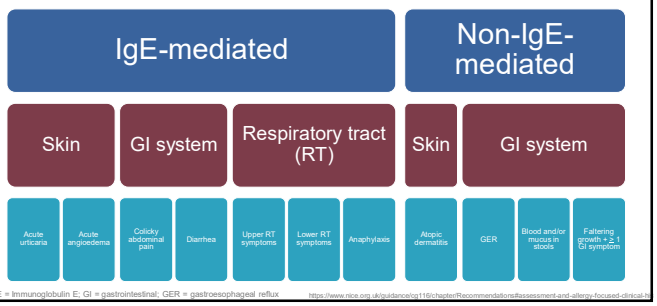
Symptomatic while being breastfed only



IgE = Immunoglobulin E; GI = gastrointestinal; GER = gastroesophageal reflux

https://www.nice.org.uk/guidance/cg116/chapter/Recommendations#assessment-and-allergy-focused-clinical-hi

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Objective #3:
Assess the evidence around food allergen content in human milk.

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Focus on cow's milk

	Observation studies	Intervention studies
# of studies	7	10
Range of detectable B-Lactoglobulin (BLG)	*0.002 ng/mL and highest reaching 800 ng/mL*	
Detectable levels of BLG	41.5%	52%
Detectable levels of BLG > ED01	1 study	2 studies
Detectable levels of BLG > ED05	0 studies	0 studies
Probability for reaction	*1:5712*	1:2893
72,822,113 = total number of 0-17 year olds in the US	Of which 2% will develop CMA (IgE-mediated) = 2% → 1,456,443	
# of children likely to react in the US	**253**	**503**

CMA = Cow milk allergy; IgE = Immunoglobulin E

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Objective #4:
Provide practical information on maternal elimination diets and supplemental formula if indicated.

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Cow's milk elimination

- Breastfeeding = global standard for infant feeding.
- Maternal dietary elimination is **not without nutrition risk**.
- Nutrient composition of human milk is dynamic and dependent on many factors including the maternal diet.
- Elimination of foods such as milk, egg, wheat, soy, fish, and nuts, and eliminating multiple foods requires dietary planning to support the nutritional viability of human milk.

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Cow's milk elimination (cont.)

Certain nutrients, such as **Ca**, Fe, Zn, Cu, & folate, are **NOT** highly dependent on maternal diet.

Yet, if a mother is avoiding cow's milk from her diet, the nutritional composition of the diet should be assessed to ensure sufficient intake of all these nutrients.

- Fortified grains → typically one of the 1st foods fed due to higher iron content + the need for iron in the diets of exclusively breastfed infants by 4-6 months of age.

Thiamin, riboflavin, vit. B6, vit. B12, choline, vit. A, **vit. D**, selenium, & **iodine** as well as types of fatty acids are dependent on maternal diet.

- To avoid vit. D deficiency, the DGA and AAP recommend breastfed and partially breastfed infants be supplemented w/ 400 IU/day vit. D beginning in the first few days of life.

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Nutrients of consideration during breastfeeding

Need for **iodine** and **choline** increases during breastfeeding

DGA recommend lactating parents consume **290 mcg iodine** and **550 mg choline** daily throughout the first year postpartum.	**Iodine** can be found in: ✓ Dairy products ✓ Eggs ✓ Seafood ✓ Iodized table salt	**Choline** can be found in: ✓ Dairy products ✓ Eggs, ✓ Meats ✓ Some seafood ✓ Beans ✓ Peas ✓ Lentils	HCPs should work with lactating mothers to determine if they need an iodine or choline supplement to achieve adequate intake.

DGA = Dietary Guidelines for Americans; HCPs = Healthcare professionals

Rajani et al. J Allergy Clin Immunol Pract 2020;8:52-57

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How to substitute important nutrients

Protein	Fat	Omega-3 fatty acids	Fiber
Meat	Vegetable oils	Cold water fatty fish (DHA & EPA)	Whole grains
Eggs	Seeds	Algal oil (DHA & EPA)	Fruits & vegetables
Legumes	Fatty fish	Walnuts (ALA)	Nuts
		Flax seeds (ALA)	

Anagnostou et al. Food Allergens and Avoidance. In The Health Professionals Guide to the Management of Food Allergies. 2023. pp. 82 – 112.

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How to substitute important nutrients (cont.)

Vit. D	Vit. B_{12}	Biotin	Folate
Fortified foods (e.g. breakfast cerals)	Animal products	Salmon	Dark green vegetables
Egg yolk	Fortified foods (e.g. nutritional yeast)	Sunflower seeds	Legumes
Fatty fish		Sweet potato	Avocado

Anagnostou et al. Food Allergens and Avoidance. In The Health Professionals Guide to the Management of Food Allergies. 2023. pp. 82 – 112.

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How to substitute important nutrients (cont.)

Calcium	Iodine	Iron
Calcium-fortified plant beverages	Seaweed	Lentils
Calcium-set tofu	Enriched grains	Tofu
Fortified breakfast cereals	Iodized salt	Fortified breakfast cereals

Anagnostou et al. Food Allergens and Avoidance. In The Health Professionals Guide to the Management of Food Allergies. 2023. pp. 82 – 112.

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Guidance on use of hypoallergenic (HA) formula in breastfed children

UK guidelines	• Consider AAF as a supplement to human milk in children who do not have symptom resolution with a maternal elimination diet
ESPGHAN guidelines	• In breastfed children with severe symptoms a HA formula may be indicated, hinting towards the use of an AAF to stabilize symptoms
WAO (via the DRACMA guidelines)	• No recommendation made regarding formula choice for breastfed infants who react to cow's milk protein in human milk.
AAP	• Breastfeeding infants who develop symptoms of food allergy may benefit from use of a HA formula as an alternative if maternal elimination is unsuccessful • eHF or if symptoms persist, AAF

UK = United Kingdom; ESPGHAN = European Society for Pediatric Gastroenterology, Hepatology, and Nutrition; WAO = World Allergy Organization; DRACMA = Diagnosis and Rationale for Action

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New resource!

Health Professional's Guide to Nutrition Management of Food Allergies

Scan for more information

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