

## Food Allergies in Infants: Can A Mother Prevent Them?

### SCIENTIST BIOGRAPHY

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### Introduction

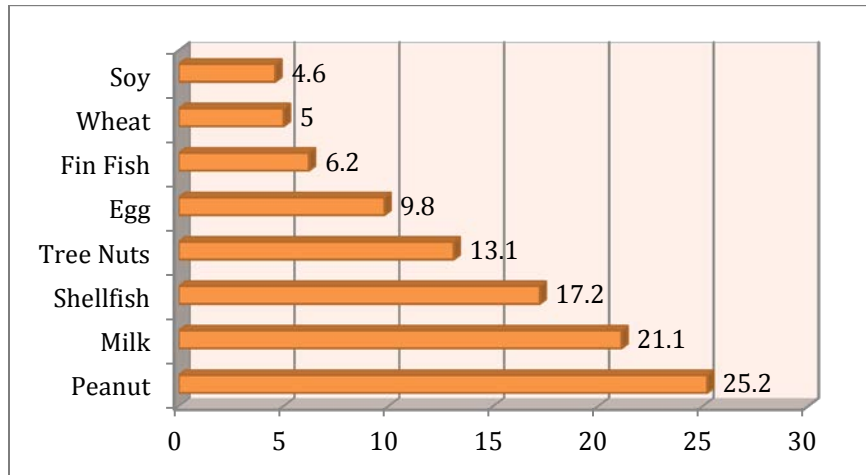
A variety of different foods can trigger an adverse reaction, and these reactions can range from mild to life-threatening. This is a topic of concern for any individual who has encountered a food provoked allergic reaction. This is especially true for a pre or postpartum mother whose ultra-nurturing state of mind can bring her to the decision of eliminating certain allergen type foods from her diet as a preventative measure to protect her child from developing food allergies. Is this a wise, or even a necessary action for a mother to take throughout the prenatal and postpartum stages of her baby's growth and immunity development? This article will examine the research behind recommendations for mothers regarding food allergies during pregnancy, lactation, and the food introduction periods of a baby's nutritional expansion.

### Food allergies

An adverse food reaction is a generic term for any reaction following the ingestion of food. Adverse food reactions include intolerance (lactose intolerance, jitteriness from caffeine, migraine headaches from tyramine in aged cheese); toxins (bacterial food poisoning, scombroid fish poisoning); food allergy (immune responses can be IgE-mediated, non-IgE-mediated or mixed [eosinophilic gastrointestinal diseases]); and neurologic disorders (auriculotemporal syndrome, gustatory rhinitis, anorexia nervosa, food aversions)<sup>1</sup>. While food allergies are an adverse food reaction, not all adverse food reactions are food allergies<sup>1</sup>. The National Institute of Allergy and Infectious Diseases (NIAID) expert panel defines a food allergy as "an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food"<sup>2</sup>.

About 3 out of every 4 self-reported food allergies are not clinically diagnosed, and might be a combination of sensory aversions rather than an actual allergy<sup>2</sup>. The clinically proven food allergies only affect about 4% of adults and 5% of children in the United States<sup>2,3</sup>. Taking a specific infant-to-toddler age focus, a study by Gupta et al. of over 38,000 children found that about 6% of children ages 0-2 have food allergies<sup>4</sup>. Fluctuations in allergy rates between childhood and adulthood are due to the fact that children can sometimes outgrow their food allergies, while adults might not develop an allergy until later in life<sup>5</sup>. This more commonly occurs with milk and egg allergies, as compared to other foods<sup>4</sup>. The Gupta study also looked at food allergy trends as a whole in American children. The most commonly seen food allergens identified in the study are shown in the table below:

Table 1: Percentage of allergen rates found in 38,480 American children with diagnosed food allergies ages 0-18<sup>4</sup>



#### Should allergenic foods be avoided by expecting mothers?

During pregnancy, 100% of the nutritional and developmental needs of the fetus are supplied by the mother. With a mother's nutrition status directly translating to the fetus during pregnancy, it can be questioned whether or not the ingestion of common allergenic foods may promote the development of atopic disease in the baby. However, there is no proven research that supports the notion that prenatal diet modification is a reliable method to prevent any development of a food allergy in the fetus<sup>2,5,6</sup>. Completed research has shown conflicting results, and the expert panel of the NIAID does not recommend restricting maternal diet during pregnancy as a strategy for preventing the development or course of food allergies in their child<sup>2</sup>. Therefore, an expecting mother should continue to implement all foods that are part of a normal recommended healthy diet for pregnant women.

#### Should allergenic foods be avoided by lactating mothers?

The Academy of Nutrition and Dietetics (AND) recommends that a mother exclusively breastfeed her infant during the first 6 months of life<sup>7</sup>. If a mother elects to follow this recommendation, the infant will once again be receiving 100% of its nutrition directly from the mother, as well as an abundance of immune modulating agents. The nutritional value of a mother's breast milk is a general reflection of the mother's nutritional status, so it is understandable that a connection may be drawn between consuming commonly allergenic foods and having that translate into a component of breast milk. However, recommendations for food allergy prevention during lactation parallel those for pregnancy, as there is no proven research that supports maternal diet modification during lactation as a reliable method to prevent any development of a food allergy in an infant<sup>2,5,6</sup>. The expert panel of the NIAID does not recommend restricting maternal diet during lactation as a strategy for preventing the development or course of food allergies in their child<sup>2</sup>. Therefore, a lactating mother should continue to consume foods that are part of a normal recommended diet for lactating women.

Now, there is a mild amount of evidence suggesting that the separate immune-modulating components of breast milk may help prevent the development of food allergies during the developmental stages of infancy through adolescence<sup>4</sup>. Breast milk contains several factors that have been shown [separately] in past research to induce or protect against food allergies. A review article by Mavroudi and Xinias regarding allergy prevention in infants estimates that human milk has about 6 agents that may promote induction of food allergies, and about 8 agents that may help inhibit allergy development<sup>8</sup>. Variations in the oligosaccharides and fatty acid chain content of breast milk in mothers make these factors extremely complex to study, but it has been examined



moderately in both human and animal trials. In a review of the immune effects of dietary oligosaccharides by Jeurink et al., conclusions suggest dietary intervention with oligosaccharides early in life could lead to the prevention of atopic food reaction<sup>9</sup>. This, among other research has led experts to assume that the immune-modulating effects of oligosaccharides work directly with immunity in the GI tract through assisted alteration of the intestinal microbiota<sup>9</sup>. Given the elevated content of oligosaccharides in breast milk, breastfeeding has not only been widely proven to be the best means of nourishment for an infant 0-6 months old, but this is also supported by a small population of pediatric organizations as the hallmark for any mother as the most effective means of reducing the risk of food allergy development in a child<sup>10</sup>. While this preliminary evidence regarding the preventative components of breast milk are promising, the realm of evidence pertaining to this subject is still lacking in some parts. Therefore, research as a whole can't support breastfeeding as a completely proven method to prevent atopic disease<sup>2</sup>.

### **What about hypoallergenic formulas?**

If a baby experiences repeated vomiting, diarrhea, fussiness, colic, or cutaneous rashes or hives after consuming standard milk-based formula, there is a chance they could have a cow's milk protein allergy. If a cow-milk protein allergy is suspected, use of a hypoallergenic (extensively hydrolyzed) formula is often recommended. Extensively hydrolyzed formulas contain protein sources that have been broken down into free amino acids and small peptides. The expert panel of the NIAID suggests that the use of hydrolyzed infant formulas, as opposed to cow's milk formula, may be considered as a strategy for preventing the development of food allergies in at-risk infants who are not exclusively breast-fed<sup>2</sup>. An infant is defined as high risk if they have a pre-existing severe allergic disease and/or a family history of food allergies<sup>2</sup>.

### **Can supplementation of any kind help?**

Infant supplementation of pre and probiotics has been studied in several randomized control trials (RCTs) to assess the effect of their immune-modulatory component on the development of food allergies. Results have been mixed, but a systematic review of these studies showed indications that probiotic therapy may help reduce the manifestations of atopic symptoms related to milk protein allergies in infants<sup>8</sup>. While the findings of these studies are somewhat promising, the research and population groups studied are still extremely limited, and not sufficient enough to professionally recommend biotic therapy as a dependable method of atopic symptom prevention in infant protein sensitivity/allergy<sup>5,8</sup>.

Maternal supplementation of fish oil has also been examined for benefits in fighting food allergy development in youth. A study by Furuholm et al. on the Swedish population looked at omega-3 polyunsaturated fatty acid (PUFA) supplementation during pregnancy and its correlation to food allergy development in infants. The intervention group received a daily supplement that contained 1.6g EPA, 1.1g DHA, and 23mg  $\alpha$ -tocopherol from the 25<sup>th</sup> week of gestation until the 3<sup>rd</sup> to 4<sup>th</sup> month after delivery. The subsequent findings indicated that omega-3 supplementation significantly reduced the risk of the infant developing a food allergy or IgE associated eczema during the first year of life<sup>10</sup>. These results seem to support the notion that omega-3 supplementation during pregnancy and lactation may reduce the risk of allergy development in the child, but the population for this study was small and more research needs to be done in order to verify this as a dependable method of prevention.

### **Should introducing allergenic foods to an infant be avoided?**

Around 6 months of life, AND recommends that parents should begin to introduce solid foods as a complementary component of their child's feeding regimen<sup>7</sup>. As a child adapts to various textures, he/she will be introduced to an array of foods that will likely encompass one or more of the most commonly found allergenic foods. While this might seem risky in relation to the efforts to prevent food allergy development, it is recommended by the European Academy of Allergy and Clinical Immunology (EAACI) and the expert panel of the NIAID that no special dietary restrictions of commonly allergenic foods are made after the age of 4-6 months for infants, as it will not provide any protective effect against the development of atopic disease<sup>2,6</sup>. Coincidentally, recent findings actually suggest the opposite of a mindset regarding allergen avoidance. Modern research has found mild evidence that advocates for early exposure to common food allergens starting at 4-6 months of age, but no earlier<sup>2,5,11</sup>. This early induction may actually prompt the infant's immune system to become tolerant, and prevent sensitivities to foods that it may have originally developed if the food were introduced later in life<sup>11</sup>. This recommendation is based in part on multiple recent studies that appear to support delayed introduction of allergens as possible risk factors for allergy to the foods or atopic disease<sup>5</sup>. One study

specifically focused on peanut allergies in the Middle East. It was found that Israeli children had significantly less prevalence of peanut allergies as compared to children in the UK, although Israeli children are commonly introduced to peanut snacks earlier in life and in larger amounts<sup>11</sup>.

### **Should certain foods that have been proven allergenic in a family history be avoided?**

Studies over the past 4 decades have found that family history plays the strongest role in offspring development of food allergies. Estimations are that a child with one allergic parent has a 38%-58% chance of developing a food allergy, while a child with two allergic parents has a 60%-80% chance of such development<sup>8</sup>. Meanwhile, a child with an immediate family history negative for food allergies has less than a 5% chance of encountering atopic symptoms from food<sup>8</sup>. If either the father of the child or any member of the family's close ancestry had a previously diagnosed food allergy, mothers may avoid those foods in order to reduce the risk of "hereditary development" in the baby. At this time, there is no research that supports the suggestion of an allergen restrictive diet during pregnancy and lactation to avoid the development of an allergy in the child, regardless of the prominence of an allergy in the child's immediate or extended family history<sup>8</sup>. Regarding the child, it is widely recommended that infants who are at high-risk of food allergies due to family history be exclusively breastfed or fed extensively hydrolyzed formula rather than a standard milk-based formula to reduce the risk of allergic reactions during the first 4-6 months of life<sup>2</sup>.

### **Summary**

There has been an extremely wide range of research that covers the questions investigated in this article, and a variety of findings that these studies have produced. While genetics inevitably plays the most influential role in food allergy development and currently there is no proven method of prevention, mothers can still take recommended steps to help induce the highest level of immune health in their child. Mothers need not make any dietary restrictions during pregnancy or lactation, but can help reduce the risk of food allergy development and promote an overall strong level of health in a child through adequate nutrition during the prenatal and lactating periods, exclusive breastfeeding to the recommended age, and proper food introduction at 4-6 months. The idea of probiotic and omega-3 supplementation might also provide preventative benefits, but their validity is much less concrete at this juncture. Children depend on their mother for 100% of growth and development, and mothers can ensure that an infant has a strong and healthy path to adulthood by following appropriate nutrition and care recommendations.

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