

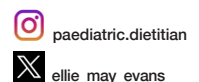


## THE RISE IN FOOD ALLERGY: WHICH THEORY WOULD YOU PICK?



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**The majority of dietitians are well aware of the common allergens affecting children, as well as the NICE 2011 guidelines providing information on assessing allergy-focused clinical histories. Between 2013 and 2019, we saw a 72% rise in the number of hospital admissions in England caused by anaphylaxis among children. The question is why?**

It is difficult for dietitians to explain the rise in prevalence of food allergies because there is no single explanation and the reason is likely multifactorial. However, that has not prevented several theories from being proposed – but which one is the most accurate?

### DUAL ALLERGEN EXPOSURE

This theory proposes that exposure to food allergens through disrupted skin barriers, such as eczema, can lead to an increased risk of developing food allergies.<sup>3</sup> If the body is first introduced to protein through the mouth and then GI tract, it may increase the sensitisation to that food and possibly the development of an allergy. In context, this would be if the infant has eczema and the skin is broken. It can then serve as an entry point for food proteins that are in the area. When the skin is exposed to these proteins, the immune system identifies them as dangerous. Thus, it will mount an immune response that is an allergic reaction.

This theory highlights both the importance of early exposure to allergenic foods, as well as the possible reason for why eczema is a leading risk factor for food allergies. It also corresponds to the most recent LEAP

study in 2015,<sup>4</sup> which found that early exposure of peanuts decreases the risk of developing a peanut allergy, so there is some evidence for this theory.

The LEAP study is well known for leading the way for the reformation of the food allergy recommendations of 2000.<sup>4</sup> These recommendations encouraged the delay of allergic foods in our infants' diets in an effort to decrease the risk of developing a food allergy. However, unfortunately, the opposite occurred and numbers rapidly increased. Whilst the LEAP study changed this guidance to suggest early introduction is vital, it has led to confusion amongst parents, which could increase the numbers of food allergens further. Nevertheless, it is unlikely that this forms a strong enough basis for the increase in allergens alone, as a slight stagnation or decrease would have been expected from 2015/16 to 2019.

### THE HYGIENE HYPOTHESIS

Another theory closely linked to this idea of dual allergen exposure is the hygiene hypothesis,<sup>5</sup> which is based on the idea that early childhood exposure to bacteria helps protect against the development of allergies. It proposes that in today's society, there is a reduced opportunity for cross-infection in households as a



**There is evidence demonstrating that taking antibiotics in childhood may increase the risk of food allergy due to killing the gut friendly bacteria alongside the bad bacteria.**

result of reduction in family sizes, improvement in hygiene and household amenities. However, this theory has been heavily criticised as it has difficulty explaining why allergic diseases occur in less affluent regions<sup>6</sup> and why the exposure to some microbial species actually increases susceptibility to disease instead, for example in the case of rhinovirus which can increase asthma.<sup>7</sup>

#### **'OLD FRIENDS' HYPOTHESIS**

A more recent theory developed by Graham Rook, called 'old friends' hypothesis is based on this foundation.<sup>8</sup> This theory proposes that the issue is not the cleanliness of the home but whether your gut encounters different types of microorganisms. This is due to the gut microbiome being dynamic and slowly changing due to the modern society in which we live. This means we have fewer 'old friend' microbes that help our immune system respond to foreign substances. There is evidence demonstrating that taking antibiotics in childhood may increase the risk of food allergy due to killing the gut friendly bacteria alongside the bad bacteria.<sup>9</sup> Therefore, a diverse diet from weaning has been shown to be protective from development of food allergies and ensures that beneficial gut bacteria grow, which can have other implications on health.

#### **VITAMIN D**

One cannot dismiss the vitamin D theory in which evidence has been established to show a relationship between sun exposure when young and allergy risk. This is based on two major studies from the US<sup>10,11</sup> and Australia<sup>12</sup> which examined prevalence of anaphylaxis admissions

as well as epinephrine autoinjector prescriptions (the treatment for anaphylaxis) and found that lower rates were observed in regions with more sunlight exposure.

A further study<sup>13</sup> also discovered that Australian babies born in autumn and winter months had higher rates of food allergy compared with those born in summer. Thus, researchers proposed the idea that levels of vitamin D could correlate to these patterns. However, a smaller scale German study<sup>14</sup> found the opposite. Therefore, it is clear that more evidence is needed in this area as both too little and too much vitamin D can be an issue. Nevertheless, it is important that vitamin D requirements are met due to other benefits such as bone health, and infants should be getting vitamin D through supplementation or formula.<sup>15</sup>

#### **GENETICS**

There is not a known specific food allergy gene, but there is likely a link between genes and the environment. Children who have parents with food allergies are more likely to develop food allergies themselves.<sup>16</sup> However, many children or infants who present in clinic with food allergies often don't have any food allergies in the family, therefore genetics alone are clearly not solely responsible for the rise in food allergies. More research into this area is needed.

#### **CONCLUSION**

Whichever theory you feel more confident to believe, one thing remains clear: early exposure is key. Therefore, we do need to do more as dietitians to encourage early allergen introduction.

Do we need to reach out and do more training with health visitors and GPs? Each region across the UK is likely to be doing some training and teaching regarding this, but is this enough to have an impact on those high numbers? Within a few years we will see what effects the updated guidelines have had, whilst

considering that if the hygiene theory is correct, then we should expect to see an influence from the COVID pandemic too.

Who knows if we will ever discover the main reason behind this recent increase, but dietitians will always have crucial role to play in the education and management of allergies.

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Questions relating to: *The rise in food allergy: which theory would you pick?*

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

Q.1	Explain the theory of dual allergen exposure causing an allergic reaction.
A	
Q.2	What does dual allergen exposure highlight with regard to allergenic foods?
A	
Q.3	Why has the LEAP study caused confusion amongst parents about allergenic foods?
A	
Q.4	What is the hygiene hypothesis?
A	
Q.5	Explain the difficulties with this hypothesis in relation to childhood exposure to allergens.
A	
Q.6	What is the theory surrounding the 'old friends' hypothesis?
A	
Q.7	Explain the evidence around vitamin D and allergy risk.
A	
Q.8	How does genetics play a part in the likelihood of developing a food allergy?
A	

Please type additional notes here.