

Soya Allergy: The facts

This factsheet aims to answer some of the questions which you and your family might have about living with soya allergy. Our aim is to provide information that will help you to avoid soya, minimise risks and know how to treat an allergic reaction should it occur. However this fact sheet does **not** replace medical and dietetic input.

There are two types of soya allergy: 'IgE mediated' (where the allergic reaction is immediate) and 'non-IgE mediated' (where the allergic reaction is delayed). This fact sheet focuses mainly on IgE mediated allergy but also covers some areas related to non-IgE mediated soya allergy.

Allergy to soya is uncommon in the UK compared with milk, egg, peanut and fish allergy. Some reports suggest that children with soya allergy have a good chance of outgrowing it, but how often this occurs is not clear. Some people with soya allergy react to other legumes such as peas and lentils and a few are allergic to peanuts. It is important, however, not to just avoid these but to discuss avoidance of other legumes with your healthcare professional.

If you know or suspect you are allergic to soya, the most important message is to visit your GP and request referral to an allergy clinic for allergy testing – even if your symptoms have so far been mild. Future symptoms could be more severe.

As you read through this factsheet you will see brief medical references given in brackets. More complete references are published towards the end of this fact sheet.

What is soya?

Soya is a food protein derived from the soya bean, which is a legume. Soya beans may be eaten fresh but are more usually dried. They are often called edamame when fresh or frozen.

Soya (also known as soy) is a common ingredient in many foods. The beans are ground to make soya flour, which is often found in bread and baked goods, including some baked bean products. Soya flour can be processed further to make Textured Vegetable Protein (TVP). Soybeans are fermented to produce tofu, which may itself be used in vegetarian prepared foods. Another fermented product is soy sauce. Soya oil is produced and may be found in some margarines and spreads as well as in oil. In addition, soya is an ingredient in many processed foods, usually as soya lecithin or soya concentrate or isolated soya protein, where it is used as an emulsifier or stabiliser.

Soya milk is sometimes suggested as an alternative to cow's milk formula where breastfeeding is not possible; however, it is not recommended for babies who are below six months old. After six months, soya milk may be



considered but it is important to seek the advice of a health professional, as the advice may vary dependent on whether your child has allergic bowel problem, an IgE or non-IgE mediated allergy. A better alternative may be an extensively hydrolysed formula or in the more severe cases an amino acid formula. It is important to get medical advice on this.

IgE mediated soya allergy – immediate reactions

If you have IgE mediated soya allergy, your body produces a certain type of antibody (part of the immune system) known as 'IgE (Immunoglobulin E) antibodies'. The IgE antibodies mistakenly recognise a protein within soya as being harmful. In response, they release chemicals, including histamine, to attack them. This release of chemicals leads to the symptoms that are commonly experienced during an allergic reaction. IgE mediated reactions tend to occur very soon after eating soya, usually within seconds or minutes.

Common symptoms of IgE mediated soya allergy

Symptoms of soya allergy among children are often mild and may simply involve a rash. Less frequently, there may be moderately severe symptoms such as vomiting, abdominal pain and diarrhoea, and very occasionally, life threatening symptoms of breathing difficulties and anaphylaxis.

In a study (Ebisawa et al., 2013) that looked at 55 Japanese children who were allergic to soybean, reactions most often involved the skin. Other children experienced oral symptoms, respiratory symptoms, diarrhoea. There was one case of anaphylaxis. The authors of the study found that a particular protein (called 'Gly m 2s albumin') was a major allergen in these Japanese children with soybean allergy. They suggest that analysis of soy specific Immunoglobulin E (or IgE; a type of antibody that plays a key role in allergic reactions), may be helpful in diagnosing soybean allergy.

There are a small number of records (documented by Armentia et al., 2013) of people experiencing reactions that researchers believe were due to soy-based materials used in the stuffing of pillows. All of these individuals had a history of food-related rhinitis and asthma; however, it may be worth checking the contents label of your pillows for soy. Your allergen specialist will be able to discuss soy-based pillow stuffing as a potential trigger for a reaction with you.

Some people are allergic to one 'primary' allergen, but they also experience a reaction to something else (known as a 'secondary allergen'). This happens where the primary and secondary allergens share a similar protein, which the immune system reacts to. A study (DeSwert et al., 2012) looking at secondary allergy to soybean (with cross-reactivity from a primary allergy to birch pollen) found that of the 15 participants with birch pollen allergy, eight were also allergic to soy. All eight had acute (severe) symptoms, and three of them showed chronic (long-term) symptoms.

Non-IgE mediated soya allergy

In contrast with IgE mediated soya allergies, IgE antibodies are not involved in non-IgE mediated soya allergies. This type of reaction is delayed (by more than two hours 2 hours and, in some cases, up to 48 hours).

Symptoms of non-IgE mediated soya allergy

Non-IgE mediated soya allergies tend to involve the gastrointestinal tract (digestive system), giving rise to symptoms such as abdominal (stomach) pains, diarrhoea (which might be bloody), vomiting, reflux and colic. Atopic dermatitis (a type of eczema) is another possible symptom which often co-exists with the bowel problems. In rare cases, FPIES (Food Protein Induced Enterocolitis Syndrome) may occur. This is more common in babies and young infants. Typically, symptoms of FPIES include diarrhoea and severe and repeated vomiting, and occur 2-3 hours after exposure to the allergen (in this case soya).

Getting a diagnosis of soya allergy

Because symptoms can be severe or delayed, it is important to see your GP as soon as possible if you suspect you have soya allergy. Some GPs have a clear understanding of allergy, but allergy is a specialist subject so it is more likely that your doctor will need to refer you to an allergy clinic. Anyone who has suffered anaphylaxis should certainly be referred as should patients whose symptoms do not resolve.

Your GP can locate an allergy clinic in your area by visiting the website of the British Society for Allergy and Clinical Immunology (www.bsaci.org).

Once you get a referral, the consultant will discuss your symptoms with you in detail as well as your medical history. Even for an experienced consultant, soya allergy is sometimes difficult to diagnose. It is important to have appropriate tests (such as skin prick tests) and to have the results reviewed and interpreted by a specialist. In cases where some uncertainty about a diagnosis remains, the consultant may recommend a 'food challenge'; this is where the patient eats a small amount of soya, increasing the dose gradually, to test whether or not a reaction occurs. This must only be done by an experienced consultant in a medical setting.

Even when there is a positive diagnosis, allergy consultants have no way of telling you how severe your next allergic reaction is going to be. It is not true that each allergic reaction is more severe than the last one. The next reaction might be just the same, it might be mild, or it could be a lot more severe. Many factors affect severity including the amount eaten, recent infection, associated heavy exercise or emotional stress, associated asthma and simultaneous exposure to another allergen such as in pollen allergic people during the pollen season.

Your history may contain important clues about the severity of your allergy. For example, the seriousness of any past reaction and the amount of soya that caused it are important factors. If you have reacted to a very small amount of a food containing soya, your allergy may be severe.

Treating symptoms

If soya allergy is strongly suspected, and especially when allergy tests have confirmed it, you may be prescribed adrenaline (also known as epinephrine). This prescription is more likely for people with an IgE mediated allergy. The adrenaline injectors prescribed in the UK at present are Emerade®, EpiPen® and Jext®. These injectors are easy to use and designed for self-administration. You must ensure that you receive good training in its use. If you are prescribed an injector, it should be available at all times – with no exceptions. Medical attention should still be sought after use as symptoms may return after a short period and more than one injection of adrenaline may be required to control the reaction.

If you are prescribed an adrenaline injector, you will need to know how and when to use it. Ask your GP or allergist for advice. You can also find help on the website relevant to the injector you carry.

People who have asthma in association with soy allergy must ensure that their asthma is well controlled as poor control is a factor that influences the risk of anaphylaxis on exposure to soy.

Emergency treatment of anaphylaxis – what injectors are available?

Pre-loaded adrenaline injection devices – Emerade®, EpiPen® or Jext® – are available on prescription for those thought to be at risk of a severe reaction.

Emerade® is the most recent single use adrenaline auto-injector to become available. It has a needle guard to protect against needle stick injury. Visit www.emerade-bausch.co.uk

EpiPen® has a spring-loaded concealed needle. The built-in needle protection keeps the needle covered during and after use. Visit www.epipen.co.uk.

Jext® has a locking needle shield which engages after use, designed to protect against needle injury. Visit www.jext.co.uk.

Avoiding soya

The first line of defence is to avoid foods that contain soya but it is also important to find suitable alternatives to ensure that you get the nutrients your body needs. To avoid soya, it is vital to read food labels carefully every time you shop. Remember that ingredients are sometimes changed. It is helpful that all pre-packaged food sold within the EU, including the UK, must declare and highlight the presence in the ingredient list, of major allergens including soya, even if they appear in small quantities.

The food allergen labelling laws that cover pre-packed food now also apply to the catering sector. When eating out or buying takeaway food, food businesses will be required to provide information on allergenic ingredients. This information can be provided in writing and/or orally. If information is provided orally, the food business will need to ensure that there is some sort of written signage that is clearly visible, to indicate that allergen information is available from a member of staff. Systems should also be in place to ensure that, if

requested, the information given orally is supported in a recorded form (in writing for example) to ensure consistency and accuracy.

In some other European countries, food businesses are required to provide the information only in writing

You should also question staff very directly, asking whether soya is an ingredient of the food you have chosen or whether there is a risk of cross-contamination. Don't be afraid to ask the waiter to check with the chef.

Soya can be used in a wide range of foods. Examples include:

- **Tofu** – Another name for soya bean curd. Tofu is a concentrated form of soya and is often used as a protein source for vegetarians or others cutting down on meat. Soya bean curd is traditionally used in some stir fries and soups in the Far East
- **Baking products** - Soya flour is used extensively in the bakery industry and is present in many types of bread. As fresh bread from bakeries does not carry ingredient lists, it is best to go for pre-packaged bread and check the ingredients. Other foods to watch out for include cakes and biscuits
- **Infant foods** – some may contain soya flour
- **Vegetable protein** - Hydrolysed vegetable protein (HVP) and textured vegetable protein (TVP)
- **Lecithin** – Lecithin (E322) is an emulsifier normally derived from unrefined soya oil and occasionally from rapeseed oil. Soya lecithin has to be labelled under EU Directive. Although the risk of reaction to soya lecithin may be small, we advise that you seek advice from your doctor or allergy specialist about whether you should avoid it.
- **Soya sauce** – Also known as soy sauce. This is widely used in Far Eastern recipes and is also commonly used to add a savoury flavour to soups, gravies, stews and sauces
- **Medicines** – Always ask your pharmacist if soya is an ingredient of medicines

Soya oil

Refined soya oil is likely to be safe for the vast majority of people with soya allergy. It is used in many foods including salad dressings and margarine. Unrefined soya oil contains far more of the protein that can trigger a reaction, so it would be more risky; however, it is rarely used.

Rigby et al. (2011) found that each stage in the refining process reduces the content of the protein that can trigger a reaction. Completely refining soya oil reduces the content by at least one hundred times. The researchers state that even a highly sensitive individual would need to consume a vast quantity (around 50g) of highly refined oil to experience an allergic reaction.

Is there a link between milk and soya allergy?

There is no common protein in soya and cow's milk and therefore no direct link, however, there is a possibility of a having concomitant cow's milk allergy. A concomitant allergy is where a reaction to one allergen is more

likely to occur or be more severe in the presence of another allergen. With IgE mediated soya allergy, concomitant allergy to cow's milk is low (at around 7 – 14%), while with non- IgE mediate soya allergy, concomitant allergy to cow's milk is much higher (at around 30-50%). Your healthcare professional will be able to advise on a suitable alternative depending on your child's allergy.

The key messages

A diagnosis of a food allergy can be daunting but by thinking ahead and employing coping strategies, people affected can get on with their lives.

- Always be vigilant when food is around
- Check food labels
- Seek advice from a dietician or nutritionist on suitable soya alternatives to ensure that you are getting sufficient nutrients, particularly if you follow a vegan diet
- Be proactive when eating out
- Carry prescribed medication everywhere
- Learn how and when to use your adrenaline auto-injector
- Ensure that asthma is well managed

References

Allergy UK 2013, *What is an Allergy?* [Online] [Accessed November 2013] Available at:
<http://www.allergyuk.org/what-is-an-allergy/what-is-an-allergy>

Armentia, A., Pineda F., Martin B., San Miguel A., Gil F.J.M., Puente Y., de Lecea C., Palacios R. 2013. Anaphylaxis caused by hidden soybean allergens in pillows. *Journal of Allergy and Clinical Immunology* (Jan), pp.228 – 230

De Swert, L.F., Gadisseur R., Sjölander S., Raes M., Leus J., Van Hoeyveld E. 2012. Secondary soy allergy in children with birch pollen allergy may cause both chronic and acute symptoms. *Paediatric Allergy and Immunology*, 23(2):pp.117-23.

Ebisawa, M., Brostedt P., Sjolander S., Sato S., Borres M.P., Ito K. 2013. Gly m 2S albumin from soybean is a major allergen with a high diagnostic value in soybean-allergic children. *Journal of Allergy and Clinical Immunology*, Jun 10.

Meyer, R., Schwarz, C., and Shah, M. 2012. A review on the diagnosis and management of food-induced gastrointestinal allergies. *Current Allergy & Clinical Immunology*, Vol 25, No.1 (pp.10-17).

NHS Choices 2012, *Causes of Food Allergy*. [Online] [Accessed November 2013] Available at:
<http://www.nhs.uk/Conditions/food-allergy/Pages/Causes.aspx>

Rigby et al 2011. Quantification and Partial Characterization of the Residual Protein in Fully and Partially Refined Commercial Soybean Oils. *Journal of Agricultural and Food Chemistry*, Vol. 59(5) pp. 1752–1759.

The FPIES Foundation 2011, *About Food Protein-Induced Enterocolitis Syndrome*. [Online] [Accessed November 2013] Available at: <http://fpiesfoundation.org/about-fpies-3/>

Reviewers

The content of this Fact Sheet has been Peer Reviewed by Professor J Warner, Chair in Paediatrics, Imperial College London (at the time of publication) and Dr. Rosan Meyer, Paediatric Dietician, Great Ormond Street Hospital.

Disclosures

Prof. John Warner is Chair of a scientific advisory board undertaking trials of alternative milk formulae to prevent and treat food allergy in infancy for Danone. Prof. Warner has also received research grants to study food allergy from Danone, the Food Standards Agency, MRC, and Asthma UK.

Dr. Rosan Meyer has declared no relevant conflict of interests.

Disclaimer – The information provided in this Factsheet is given in good faith. Every effort has been taken to ensure accuracy. All patients are different, and specific cases need specific advice. There is no substitute for good medical advice provided by a medical professional.

About the Anaphylaxis Campaign: *Supporting people with severe allergies*

The Anaphylaxis Campaign is the only UK wide charity to exclusively meet the needs of the growing numbers of people at risk from severe allergic reactions (anaphylaxis) by providing information and support relating to foods and other triggers such as latex, drugs and insect stings. Our focus is on medical facts, food labelling, risk reduction and allergen management. The Campaign offers tailored services for individual, clinical professional and corporate members.

Visit our website www.anaphylaxis.org.uk and follow us on Twitter [@Anaphylaxiscoms](https://twitter.com/Anaphylaxiscoms)