

Cross-reactivity between peanuts and other legumes can lead to serious allergic reactions

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Many foods can lead to allergic reactions and this situation is further complicated by so-called cross-reactions, whereby an allergy to one particular food can trigger allergic reactions to another food. There are no treatments available for food allergies, but the establishment of two mouse models can be used to develop and test new forms of treatment, for example vaccines.

Around 4-8% of children and 1-4% of adults in the West suffer from food allergy. The most common causes of food allergy are peanuts, [nuts](#), soya, milk, fish, shellfish, flour and [eggs](#), but a total of over 170 different foods have been found to result in allergic reactions. In addition, there are the allergies that arise as a result of cross reactions to

other types of food. The only form of treatment is to avoid all consumption of the food that the person is allergic to. Allergenic substances that are hidden in [processed foods](#) therefore pose a particular problem for people allergic to foods.

Nina E. Vinje's doctoral research has led to the establishment of two mouse models for food allergy to the legumes lupin and Fenugreek (*Trigonella foenum-graecum*). These models have been used to test whether legumes such as soya, peanuts, Fenugreek and lupin can trigger allergic reactions in mice that are already allergic to lupin and Fenugreek respectively. It is important to establish good animal models for food allergies because the development of an allergic immune response depends on a complicated interaction between types of cells in several different organs. Vinje has made every effort to reduce the use of laboratory animals to a minimum during her project. For this reason, she used an advanced statistical method to develop the models in order to gain as much information as possible from the use of as few animals as possible.



Lupin and Fenugreek are examples of so-called “new” and “hidden” allergens which have been introduced to Norway, for instance in ready-made meals, over the last 10-15 years. Lupin was introduced as a supplement to wheat flour in various bakery products because of its ability to promote good baking. Fenugreek is used as an ingredient in foods such as curry, chutney and spiced tea and is well known in Asian dishes. Packaging often does not show whether Fenugreek is an ingredient, as the consumer information merely says “spices”. Both lupin and Fenugreek can lead to serious cross-reactions in patients with [peanut allergy](#), in contrast to other legumes such as soya and peas. This fact was discovered due to messages sent in to the Food Allergy Register (www.fhi.no/mataallergireg) and these discoveries contributed to the EU making it obligatory to mark lupin as an ingredient in foods.

The established mice models can be used to try out new treatments, for example vaccines against food allergies. A [vaccine](#) must be tested on animals before it can be tested on humans, both in order to find out whether it works and to make sure that it does not cause serious side effects. New foods that are to be released onto the market will also be able to be tested to see if they can cause allergies. Mice can be used for this purpose because their immune system is well charted and is relatively similar to that of humans. This means that researchers can study the clinical, anaphylactic (shock) reactions associated with [food allergy](#) in mice in order to gain a greater understanding of the mechanisms that cause [allergic reactions](#) in humans.

Vinje’s doctoral project was carried out at the Norwegian Institute of Public Health and researchers and fellows at the Norwegian Veterinary Institute and the Norwegian School of Veterinary Science have been

major collaborators.

Provided by Norwegian School of Veterinary Science

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