Food allergy is everyone's business

The Food Allergy Safety, Treatment, Education and Research Act signed by United States President Joe Biden in April, and Natasha's Law, which will be enforced from October in the United Kingdom, highlight incomplete knowledge within society on how to manage food allergy in a fail-safe way.

Food allergy is complex to navigate. As with any public health issue, it requires shared responsibility and concerted efforts across multiple stakeholders. The knowledge, activities and commitments of food system actors must be shored up to remove the potential for systemic blind spots in a societal approach to food allergy. Yet, tools for the management of food allergies remain largely in the hands of individuals and are quite rudimentary, described recently as a two-pronged approach of 'dietary elimination and emergency preparedness'¹.

On 26 April 2021, President Joe Biden signed the Food Allergy Safety, Treatment, Education and Research (FASTER) Act H.R. 1202, S. 578 (ref. ²), a broad-remit bill on food allergy for the United States. FASTER will improve data collection on the prevalence and severity of specific food allergies, and will promote R&D for more effective diagnosis and prevention. It is a strong recognition of the seriousness of food allergy; however, the bill has only now added sesame to the list of ingredients that must, by law, be emphasized as allergens on food labels in the United States, joining shellfish, peanut, milk, tree nut, egg, fish, wheat and soy. This is a remarkable state of affairs, given that 0.49% of the United States' population reports a sesame allergy (with 0.23% confirming symptom criteria)³. For the 1.6 million Americans living with sesame allergy, FASTER couldn't have happened fast enough.

The prevalence of food allergy is rising worldwide, and we don't know why. Industrialized countries have been preferentially affected by the increase⁴; in the United States, 8% of children and 10% of adults have a food allergy. Challenge-proven food allergy affects 5–10% of children under five in the United Kingdom, Norway and Australia, but self-reported food allergy rates are higher. Comparable rates of challenge-confirmed food allergy to these have also been reported in Thailand, China and South Africa⁵.

Clinically, the risk factors with most traction are characterized as 'the five Ds': dry skin, diet, dogs, dribble and vitamin D⁶. 'Dry skin and diet', more formally known as the dual-allergen exposure

hypothesis, represents a perfect storm of gene–environmental interactions whereby food allergen exposure occurs through skin inflamed by dermatitis or dysregulation of proteins such as keratin or filaggrin. 'Dogs and dribble' refers to the hygiene hypothesis, where early exposure to allergens could bolster the immune response and mitigate the development of allergy. The connotations of 'hygiene' have been problematic and the hypothesis has evolved to have greater currency as the failure to develop immunotolerance via the human microbiome⁶. Vitamin D supplementation has potential in immunomodulation and trends suggest that levels of the vitamin, influenced by diet and latitude, may be associated with food allergy. Variables within the first 1,000 days — such as the mode of delivery, breastfeeding, introduction of foods at weaning, infant dermatitis and even palm hyperlinearity — offer tantalizing clinical clues for the aetiology and prevention of food allergy.

But these hypotheses fail to capture underlying demographic, social and environmental risks a changing world presents. For example, children of East Asian and African descent who are born in a Western environment are at higher risk of food allergy than their peers. Food allergy may be triggered by exposure to new pollutants, allergens, climate, diet, housing conditions, access to healthcare, health-seeking behaviours and cultural and psychological factors⁷. The transition to urbanized, industrialized lifestyles seems to play a role, and environmental triggers brought about by climate change are also considered to be red flags for future trends in allergy⁸.

Labelling is one of the most powerful strategies against food allergy. While the United States will now move from the mandatory labelling of 8 to 9 food allergens, the European Union requires compulsory labelling of 14. Mandatory labelling requires the presence of these allergens as ingredients or processing aids to be emphasized on the food label. A comprehensive approach to labelling is vital, but loopholes, complacency and incomplete or poorly communicated information remain significant challenges.

Such a loophole in the mandatory labelling of allergens will be closed in the United Kingdom this October, when *Natasha's Law* comes into force. Food prepared and pre-packed for direct sale in-store, such as sandwiches prepared and packaged within food service outlets, will have to display full ingredient and allergen lists on labels by law. The loophole in what seemed to be a comprehensive system, trusted and understood by those affected by food allergy, had tragic consequences for Natasha Ednan-Laperouse and her family in 2016. *Natasha's Law* will require food service retailers to meet responsibilities for transparency, training of staff and investment in equipment. It will be a great undertaking by businesses and they must be supported by others in the food system, particularly with education and technological solutions.

Research and technological development have crucial roles to play in the mitigation and management of food allergy. There is a need for better data on both confirmed and self-reported prevalence. The aetiology of food allergy needs greater clarity, with emphasis on the impacts of global demographic and climate change. With evolving knowledge of the exposome, the microbiome, means of reducing allergenicity through crop breeding and ingredient processing, and the power that globalized supply chains can bring for monitoring, traceability and recall of food products, the prevention of food allergy onset and triggering is surely possible.

However, human behaviour, misinformation and misperceptions underpin much of the burden of food allergy. All too often, and with unthinkable consequences, food allergy is not taken seriously in society and those navigating a complex world with confirmed and self-reported food allergy bear significant psychosocial burdens. Food allergy is increasing in prevalence for reasons that are not yet understood, and its management requires the lens and spirit of public health. □

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