Food Allergens Update

Hazel Gowland  PhD, PGCE, MREHIS, FIFST, FRSPH

Expert patient, researcher and trainer in food allergy risks

Brighton and Hove Training – February 2022
Hazel Gowland: Allergy Action

Advocacy
- Early peanut & nut allergy
- 1994 Anaphylaxis Campaign
- Policy shaping
  - Regulators
  - Caterers
  - Schools
  - Hospitals
  - Prisons

Research
- Consumer behaviour
- Fatal anaphylaxis
- Regulation
- Clinical studies

Training
- EHOs TSOs
- Public analysts
- Clinicians
- Scientists
- Undergraduates
- Postgraduates
- Manufacturers
- Suppliers
- Retailers
- Caterers
Disclosures

Visiting Fellow University of Southampton and Lecturer on MSc Allergy

Imperial College Lecturer on MSc Allergy

Member of Register of Experts – Food Standards Agency

Food Special Interest Group member - RSPH

Safefood Food Safety Knowledge Network Expert

Scientific Committee / Food Regulatory Group – IFST

EAACI Task Force Member – Adolescents and young adults

Joint Award in Allergy Awareness with REHIS – training qualification
What is changing?

Epidemiology

Food allergens

Innovation

Regulation and reputation
What is changing?

- New ways to buy food
- Understanding reaction severity
- Landmark fatal reactions
- Lessons learned
- Changing purchasing behaviour
- Legislation used
- Enforcement activity
- Consumer expectations
What is changing?

Like many other businesses, we are currently experiencing challenges due to staff shortages, some sporadic supply chain issues and remaining COVID-19 safety measures. Our menus clearly highlight where allergens are present within the ingredients and whilst allergy-free menu options are still available, unfortunately, we cannot, in the current climate, provide a 100% guarantee against cross-contamination, either within our supply chain or in our restaurants or takeaway service; we cannot provide details of any ‘may contain’ allergen statements.
Teenager asked to leave TGI Friday's in Brighton after highlighting allergies
The allergy journey
People choosing and supplying food
Allergies throughout life
Protection and Prevention
Prevention by early dietary intervention

Babies who are likely to develop food allergy

Exposure without eating eg via eczema broken skin can **sensitise**

Exposure by early consumption – regularly eating the food allergen can **protect**
Immunotherapy with food

Supervised consumption of the food allergen

Start with the food allergen well broken down by cooking
Eg Milk in biscuit, egg in muffin

Then in forms where it is increasingly intact

- Doesn’t work for all
- Side effects – GI?
- Life-long consumption?
Immunotherapy with pharma

Pharmaceutical products being developed

Calibrated increasing doses of peanut flour in capsules for consumption
- May not work for all
- Side effects – GI?
- Life-long consumption?

Drops under tongue

Skin patches for peanut and other foods
Diagnosis and management

- Read referral
- Take history

Note:
- Reactions and symptoms
- Asthma
- Eczema
- Allergic rhinitis
- Medication and AAIs
- Family
- Food allergen avoidance skills
- Age-related issues
- Any anxiety?
Managing symptoms

Symptoms can be unpredictable and may change throughout life

Adrenaline auto-injectors
• Epipen
• Jext
• Emerade

Given in the thigh
Call 999

• Anaphylaxis
• Difficulty breathing
• Faint or floppy
Management challenges

- Asthma management – prescription costs
- Not carrying AAI even if prescribed
- Unfamiliar with AAI
- Self awareness of vulnerabilities eg PMT, infection
- Posture
- 2nd pen in other leg
- Alcohol, drugs?
Which foods?
UK: Cause of fatal food induced anaphylaxis by trigger in children (younger than 16) and adults, 1992-2018

#14allergens

Anaphylaxis Campaign members avoiding foods on the Labelling Annex II

2016

2017
Beyond #14allergens

Anaphylaxis Campaign members avoiding foods not on the Labelling Annex II

2016

2017
Other allergens

#StupidPeas
Plant-based alternatives to milk
Lookalike ‘meat’
Plant-based foods – ‘Vegan’

BBQ Jack Fruit Burger

136 word Ingredient list

- Jackfruit
- Kidney beans
- Buckwheat
- Black Turtle Bean
- Butter Beans

May contain: Tree Nuts, Peanuts and Sesame seeds
Mystery reactions

Food-Induced Anaphylaxis: Role of Hidden Allergens and Cofactors

*Isabel J. Skypala*

Department of Allergy and Clinical Immunology, Imperial College, Royal Brompton and Harefield NHS Foundation Trust, London, United Kingdom

- Food anaphylaxis associated with popular concepts of health and fitness
- Food and exercise culture: promotion and marketing, health-giving properties
- Eg meat substitutes, wheat substitutes, supplements
- Some ingredients confirmed as cause of allergic reactions
- Co-factors eg exercise?
New protein sources

Clinical Communications

Shellfish allergy is a risk factor for cricket anaphylaxis
Lucy Duan, MD\textsuperscript{a}, Jennifer A. Hoang, HBSc\textsuperscript{b},
Akash Kothari\textsuperscript{b}, Thomas Eiwegger, MD\textsuperscript{a}, and
Peter Vadas, MD, PhD\textsuperscript{c}

Clinical Implications

- The risk of life-threatening anaphylaxis after ingestion of crickets in individuals with preexisting crustacean shellfish allergy is not widely recognized. As insects are increasingly promoted as a source of protein worldwide, physicians need to educate patients about this risk.
Bioavailability of nutrients

Prof Chris Elliott OBE @QUBFoodProf · 2h
There is a massive difference in the bioavailability of micronutrients from natural sources and those added as products often sourced from the Indian and Chinese chemical industries.
Diet restrictions and nutrition

Veganism and paediatric food allergy: two increasingly prevalent dietary issues that are challenging when co-occurring

Jennifer L P Protudjer 1 2 3 4 5, Andrea Mikkelsen 6 7 8

- Risk of **nutritional deficiencies**, particularly during childhood
- Comorbid diseases eg asthma may actually increase energy and nutrient requirements
- Diet restrictions – both food allergy and vegan limit sources of important nutrients
- Need for dietary variety and/or increased consumption due to **reduced bioavailability**
- Blood serum iodine, iron, zinc, calcium, Vitamins B12, D, B2, and A, selected n-3 fatty acids and protein
- Nutrients all **more abundant in animal** vs plant foods
Food allergens in non foods

- Not always recognised

#14allergens  
#Beyond14allergens

- Household
- Personal Care
- Cosmetics
- Medication

Skin contact?
- Sensitisation
- Symptoms
Research Priorities

Identifying key priorities for research to protect the consumer with food hypersensitivity:
A UK Food Standards Agency Priority Setting Exercise

Who was involved?

- Allergy doctors: Clinical and Research
- Allergy dietitians: Clinical and Research
- Psychologists: Clinical and Research
- Patient / Consumer representatives
- Patient support and research charities
- Food scientists and analysts
- Industry food safety and allergy professionals
- Local authority food officers: TS and EH
- FSA Research Managers
FSA Research priorities: 2021
Food Hypersensitivity

Out of scope

- Diagnosis
- Desensitization
- Other questions already being studied

Communication
of allergens both within the food supply chain and then to the end consumer (ensuring trust in allergen communication)

Inclusion
The impact of socio-economic factors on food hypersensitivity

Tolerance
Mechanism(s) underlying loss of tolerance in Food Hypersensitivity (FHS)

Severity
Drivers of severe reactions

Innovation
Risks posed by novel allergens and processing methods
Food Allergy Investigations

UK fatal anaphylaxis suspected or confirmed from food allergy since 1988

- Supporting families following fatal reactions
- Supporting coroners, police and local authority investigations

Investigating and recording ‘near misses’ and other reactions and complaints since 1994

- Supporting consumers
- Working with regulators
- Learning from and advising businesses


Hospital admissions increase

UK Time trends in hospital admissions per 100 000 population 1998 to 2018 by age

Food anaphylaxis in the United Kingdom
Hospital admissions and fatalities, 1998-2018

Summary
Hospital admissions for food induced anaphylaxis have increased between 1998 and 2018, however the case fatality rate has fallen. Cow's milk was responsible for 26% of deaths in school aged children.

Study design
Data analysis: National hospital data from the United Kingdom for admissions and mortality

Population
101,891 hospital admissions for anaphylaxis
30.1% coded as due to a food trigger

Outcomes
Food induced anaphylaxis

Age (years)
- 0-14
- 15-59
- ≥60

Hospital admissions per 100,000 population
1996 2003 2008 2013 2018

Case fatality rate due to food anaphylaxis
Confirmed Unconfirmed
Anaphylaxis admissions with fatal outcome (%)
1998 2003 2008 2013 2018

Anaphylaxis fatalities by allergen

Key allergens
- Milk
- Unknown
- Peanuts
- Tree and unidentified nuts

Children <16 years

Adults

https://www.bmj.com/content/372/bmj.n251
Food and the law
Food Allergy and the Law

Fatal cases

‘Near misses’, other reactions and complaints

No avoidance
Avoiding wrong allergen
Mistake by person, family, friend
Mistake by food business
Non compliance or negligence by food business

Root cause?
Food hypersensitivity: Offences

1. The food sold was not of the nature, substance or quality demanded
   (S14 FSA 1990)

2. The information provided with the food (label, face to face, website, menu etc) was misleading
   (S15 FSA 1990)

3. The food was unsafe because the information provided was incorrect
   (178/2002)

4. The business had failed to highlight on the packaging, or signpost, keep and make available information about #14allergens
   (FIR 1169/2011)

5. The food business had not assessed risks (including the possibility of FH people eating their food) and put in effective controls
   (Article 5 852/2004)

6. The business had failed to ensure people affected by its activities (eg customers) were not exposed to health and safety risks or not alerted to such risks
   (HSAW Etc 1974)

7. Manslaughter – possibly through gross negligence
Allergen cases in UK courts

68 convictions:
- Scotland 1
- Northern Ireland 2
- Wales 14
- England 51

England:
- North West 14
- South East 12
- Midlands 12
- North East 11
- South West 2

UK - Allergen-related court hearings by year
January 2014 - 31 Jan 2020
Penalties

Fines, costs and compensation

Community orders

Jail

£
Additional business risks

Civil claim

Reputational damage

Loss of business

£

tripadvisor

United Kingdom

Food Hygiene Rating

Major Improvement Necessary

facebook
Accessible food information

Ingredients
Including #14allergens

Full labelling on factory products

Catering – need to make #14allergens available

Menus, folders, websites, signs need to encourage people to ask
May contain – where did this risk arise?

Field  Factory  Foodservice
Controlling allergen risks
How much is too much?

Thresholds and severity

Affected by

- Asthma
- Eczema
- Medication
- Infection
- Exercise
- Stress
- Lack of sleep
- Age
- Alcohol
- Hormones eg PMT
Recognised and accepted thresholds for all relevant allergens (ED01 ED05 ?)

At population level

Accessible and accepted analytical detection methods

Effective in different matrices

The effect of sleep deprivation and exercise on reaction threshold in peanut-allergic adults: a randomised controlled study

Shelley Dua PhD1,2, Monica Ruiz-Garcia PhD3, Simon Bond PhD3, Stephen R Durham PhD4, Ian Kimber PhD5, Clare Mills PhD6, Graham Roberts DM1,5, Isabel Skypala PhD7, James Wason PhD8, Pamela Ewan MBBS1,12, Robert Boyle PhD2, 13 and Andrew Clark MD1,12
Quality of life Strategies
The impact of food allergy

Support
Vulnerable
Food
Stress
Bullying
Pschologist
Trust
CBT
Confidence
Counselling
Uninvited
Guilt
Disability
Information
Friends
Family
Clinic
Competent
Psychiatrist
Excluded
Life skills for young adults

- Recognise your own symptoms
- They may change over time
- Never go off on your own
- Always tell / take a friend
- Carry AAIs all the time
- Download AAI instructions on your phone
- Obtain trainer AAIs - practice with friends and family
- Try to give 2nd AAI in other leg
- Don’t stand up. Roll on floor
To snog or not to snog?

Peanut proteins can be found in saliva an hour after consumption

Even after:
- Teeth cleaning
- Gum chewing

Intimate contact:
- Food eaten?
- Products used?
- Pets?
Useful books

- Understanding Allergy
  - Dr. Sophie Farooque

- My Family & Food Allergies
  - The All You Need to Know Guide
  - Alexa Baracaia
Key message for both consumers and businesses
What can we learn from recent cases?
Paul Wilson

Paul Wilson’s curry order
January 30th, 2014

Leading to conviction for gross negligence manslaughter and other food offences
R v Zaman May 2016 - Offences

- **Gross negligence manslaughter** – causing the death of Mr Wilson
- Placing food on the market that was *unsafe and injurious to health* (178/2002 EC and Food Hygiene (England) Regulations 2013)
- Selling food *not of the substance demanded* (Food Safety Act 1990)
- Falsely describing food as containing almonds when it contained peanuts (Food Safety Act 1990)

Food offences – **18 months** (on their own)
Sentenced to **6 years** in jail in total

(These offences took place before December 2014 when the Food Information Regulation 1169/2011 EC became enforceable.)
Appeal autumn 2017

Royal Courts of Justice
Strand, London
08/11/17

….. the Appellant's negligence in this case was not just gross; his behaviour, driven by money, was appalling.

Given the very serious aggravating factors, even though the Appellant was a man of good character, we are wholly unpersuaded that a sentence of six years after a trial was manifestly excessive or, indeed, excessive at all.

Conclusion
The appeal in respect of both conviction and sentence is dismissed
Young people: tragic circumstances

Milk in yogurt used to bind meat in a doner kebab

Peanut present in Indian food requested nut free

2cm x 2cm piece of cheese down back of shirt in school break
July 17th, 2016
7am Heathrow Terminal 5

Natasha, her friend and father Nadim

Bought food from open plan Pret counter
Long queue

Checked wrapped baguette

Sticker: grilled artichoke hearts, basil and tapenade

Natasha could eat and liked all those ingredients

Agreed with her father that it was suitable for her

She ate most of the baguette

Boarded the plane
Allergen notices

It is disputed whether the display cabinet had any stickers inviting people to get allergen information from staff at the counter.

Those seen in other branches at the time were white and transparent.

After this date, the stickers were changed
Coroner’s Report to prevent future deaths – Regulation 28

INVESTIGATION and INQUEST

On 03/08/2016 I commenced an investigation into the death of Natasha Charlotte Rose Ednan-Laperouse, 15 years old. The investigation concluded at the end of the inquest on 28/09/2018. The conclusion of the inquest was (2) Anaphylaxis (4) Natasha Ednan-Laperouse died of anaphylaxis in Nice on the 17th July 2016 after eating a baguette, purchased from Pret-a-Manger at LHR T5. The baguette was manufactured to Pret specifications and contained sesame to which she was allergic. There was no specific allergen information on the baguette packaging or on the langar barker and Natasha was reassured by that.

CIRCUMSTANCES OF THE DEATH

Natasha travelled with her father and friend for a short holiday in Nice on the 17th July 2016. She was allergic to sesame. She bought a baguette after checking the ingredients. She had eaten at Pret previously and was reassured by what she took to be their high standards. She ate the baguette. The baguette contained unlabelled sesame at a ratio of 2.41% expressly commissioned by Pret. She developed an anaphylactic reaction on the plane to Nice and despite best efforts succumbed to that, dying in hospital in Nice shortly after landing.

Prepacked for direct sale – Natasha’s Law

Food allergen labelling and information requirements
Technical Guidance
Published: June 2020
Natasha’s Law
October 1\textsuperscript{st} 2021

Labelling items prepacked on site

Before the customer chooses or orders them

Name of item, ingredients, 14 allergens
#PPDS Challenge

A fast food business at a visitor attraction serves 1300 burgers in an hour at lunchtime.

All the standard burgers are prepared in advance and served in boxes to meet the busy lunch hour. They are therefore Prepacked for Direct Sale - #PPDS.

Only those for a customer declaring a particular allergy or preference are made to order. This takes extra time.

Extra precautions include a written note of the special order, additional checks of ingredients, segregation in the preparation and packing process, the use of a special dietary sticker and an extra check to ensure the right customer is served the special meal.
How to make a #PPDS label for a chicken fillet burger?

7 components plus box
<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken fillet</td>
<td>111g</td>
<td>Chicken Breast (64%), Wheat Flour, Water, Palm Oil, Modified Tapioca Starch, Salt, Sugar, Black pepper, Wheat Gluten, Onion Powder, Colours (Paprika Extract, Turmeric Extract). Raising Agents (Disodium Diphosphate, Sodium Bicarbonate). Dextrose, Garlic powder. For allergens, including cereals containing gluten, see ingredients in Bold.</td>
</tr>
<tr>
<td>Frying oil</td>
<td>?</td>
<td>Partially hydrogenated rapeseed oil, Antifoaming agent (E900) Contains: None of the 14 Food Allergens</td>
</tr>
<tr>
<td>Bun</td>
<td>67g</td>
<td>Fortified WHEAT flour (WHEAT flour, Calcium carbonate, Iron, Niacin, Thiamin). Water, Rapeseed oil, Yeast, Dextrose, Linseed (2.9%), Sugar, Salt, Emulsifiers (E481, E427e, E471), Flour treatment agent (E300), Preservative (E282).</td>
</tr>
<tr>
<td>Mayonnaise</td>
<td>14g</td>
<td>Rapeseed oil (70%), water, spirit vinegar, pasteurised egg yolk* (5%), sugar, salt, mustard seeds, thickeners: xanthan gum and guar gum, antioxidant (calcium disodium edta), spices *from free range eggs.</td>
</tr>
<tr>
<td>Processed cheese slice</td>
<td>13g</td>
<td>Cheese (70%) (MILK) (contains Acidity Regulator: Citric Acid), Palm Oil, Emulsifying Salt (Trisodium citrate), Natural Cheese Flavouring (MILK), Preservative (Sorbic acid), Colours (Beta-carotene, Paprika Extract), Anti-caking agent (Sunflower Lecithin).</td>
</tr>
<tr>
<td>Slice of bacon</td>
<td>12g</td>
<td>Pork belly 98%, Salt, Antioxidant (Sodium Ascorbate), Preservative (Sodium-nitrite), Beechwood smoke.</td>
</tr>
<tr>
<td>Firecracker sauce</td>
<td>10g</td>
<td>Spirit vinegar, water, concentrated tomato puree (17%), sugar, date puree, chipotle paste (5% tomato puree, smoked jalapeno peppers, water, onion, spirit vinegar, sugar, peppers, salt, garlic, spices, parsley, spice extract), modified starch, salt, concentrated apple juice, chilli powder, smoke flavouring, spice, garlic powder, onion powder, preservative (potassium sorbate), spice extract.</td>
</tr>
<tr>
<td>Iceberg lettuce</td>
<td>5g</td>
<td></td>
</tr>
</tbody>
</table>

PPDS labels need to have all the ingredients listed but not the percentages.
September 2019

- Owen Carey
- Died April 2017
- Day out in London
- Buttermilk chicken
- Byron burgers
- He (and family) asked to avoid milk
- Allergy mentioned to waiting staff
Pizza Hut waiter gave boy, 3, with severe allergy cheese – leaving him GASPING for air

A BRAVE toddler allergic to dairy battled for his life after Pizza Hut served him cheese – despite his parents requesting a vegan dish.

• Blackpool Pizza Hut – waiter James Butterworth
• Family of Zayaan Hussain 3 – milk allergy
• Offered and accepted vegan non milk cheese on his pizza
• Waiter served vegetarian Margarita containing milk
• Few bites – ill and drowsy, oxygen, hospital, emergency treatment
• Waiter tried to cover tracks – change incorrect order on computer
Conviction and penalty

Butterworth was fined £290.

He must pay the child £800 compensation and £830 court costs
Nut allergy woman home after five years

Amy May Shead suffered a severe allergic reaction after being served a nut on a holiday to Budapest.
References


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