

*Food intolerance
and the
food industry*

Edited by Tarandh Dean

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Taraneh Dean**



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Contributors

Chapter 1

Dr Taraneh Dean
The David Hyde Asthma & Allergy
Research Centre
St Mary's Hospital
Newport
Isle of Wight PO30 5TG

Tel: +44 (0)1983 534187
Fax: +44 (0)1983 534907
E-mail: dean@port.ac.uk
 tara.dean@iowht.swest.nhs.uk

Chapter 3

Dr Belinda Bateman
The David Hyde Asthma & Allergy
Research Centre
St Mary's Hospital
Newport
Isle of Wight PO30 5TG

Tel: +44 (0)1983 534187
Fax: +44 (0)1983 534907

Chapter 4

Dr Jonathan Hourihane
Institute of Child Health
30 Guildford Street
London WC1N 1EH

Tel: +44 (0)20 7242 9789
Fax: +44 (0)20 7813 8494
E-mail: J.Hourihane@ich.ucl.ac.uk

Chapter 5

Dr Hasan Arshad
The David Hyde Asthma & Allergy
Research Centre
St Mary's Hospital
Newport
Isle of Wight PO30 5TG

Tel: +44 (0)1983 534373
Fax: +44 (0)1983 822928
E-mail: sha@soton.ac.uk

Chapter 6

Ms Fiona Angus and J. Smith
Leatherhead Food Research Association
Randalls Road
Leatherhead
Surrey KT22 7RY

Tel: +44 (0)1372 376761
Fax: +44 (0)1372 386228
E-mail: fangus@lfra.co.uk

Chapter 7

Dr Sally A Kilburn
School of Postgraduate Medicine

x Contributors

Gloucester House
Queen Alexander Hospital
Cosham PO6 3LY
Tel: +44 (0)23 9228 6236
Fax: +44 (0)23 9228 6227
E-mail: sally.kilburn@port.ac.uk

Chapter 8

Ms Johanna Hignett
Nestle UK Limited
St George's House
Croydon
Surrey CR9 1NR
Tel: +44 (0)20 667 5532
Fax: +44 (0)20 8667 6061
E-mail: johanna.hignett@nestle.com

Chapter 9

Mr David Reading
The Anaphylaxis Campaign
PO Box 149
Fleet
Hampshire GU13 9XU
Tel: +44 (0)1252 542029
Fax: +44 (0)1252 377140

Chapter 10

Drs Abbas Khakoo, Graham Roberts and
Gideon Lack
Department of Paediatric Allergy and
Clinical Immunology
St Mary's Hospital
Praed Street
London W2 1NY
Tel: +44 (0)20 7886 6384
Fax: +44 (0)20 7886 1129

Abbreviations

AAA	Action Against Allergy
ACE	angiotensin converting enzyme
ADSA	Association for Dietitians in South Africa
ALBA	Dutch Food Intolerance Databank
BAF	British Allergy Foundation
BCA	bicinhoninic acid
BDA	British Dietetic Association
BHA	butylated hydroxyanisole
BHT	butylated hydroxytoluene
BRC	British Retail Consortium
CCP	critical control point
CMA	cow's milk allergy
DBPCFC	double-blind placebo-controlled food challenge
DNA	deoxyribonucleic acid
EAACI	European Academy of Allergology and Clinical Immunology
EC	European Commission
EFID	European Food Intolerance Databanks
EFLA	European Food Law Association
eHF	extensively hydrolysed formula
ELISA	enzyme-linked immunosorbent assay
EU	European Union
FARRP	Food Allergy Research and Resource Program (University of Nebraska)
FCAA	Food and Chemical Allergy Association
FCPMC	Food and Consumer Products Manufacturers of Canada
FDA	(US) Food and Drug Administration

xii Abbreviations

FDF	Food and Drink Federation
FEIA	fluorescent enzymatic immunoassay
FEV1	forced expiratory volume in 1 second
FIDB	Food Intolerance Databank (South Africa)
FLAG	Food Labelling Agenda
FLEP	Food Law Enforcement Practitioners
FSA	Food Safety Act
GMP	Good Manufacturing Practice
GP	general practitioner
GPSR	General Product Safety Regulations
HACCP	hazard analysis and critical control points
HF	hydrolysed formula
HLA	human leucocyte antigen
Ig	immunoglobulin
JECFA	Joint Expert Committee on Food Additives
LIVO	National Information Centre for Food Hypersensitivity (Netherlands)
MAFF	Ministry of Agriculture, Fisheries and Food
ME	myalgic encephalomyelitis
NHS	National Health Service
OAS	oral allergy syndrome
PARNUT	food for particular nutritional use
PEFR	peak expiratory flow rate
pHF	partially hydrolysed formula
RA	Research Association
RAST	radioallergosorbent test
RCP	Royal College of Physicians
RIA	radioimmunoassay
RNA	ribonucleic acid
SPT	skin prick test
TEI	Technological Educational Institution Thessaloniki
TGF	transforming growth factor
Th	T-helper
TNO	Netherlands Organisation for Applied Scientific Research

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1

Introduction

T. Dean, The David Hide Asthma and Allergy Research Centre, Isle of Wight

1.1 Background

The documentation of food intolerance goes back to 55 BC when Lucretius, a distinguished Latin poet and philosopher, wrote his poem *De Rerum Natura* (On the Nature of Things) and said 'What is food for some, may be fierce poison for others'.

Hippocrates recognised the adverse effects of milk on some individuals when he noted:

Cheese does not harm all men alike; some can eat their fill of it without the slightest hurt. . . . Others come off badly. So the constitutions of these men differ, and the difference lies in the constituent of the body which is hostile to cheese, and is roused and stirred to action under its influence. . . . But if cheese were bad for the human constitution without exception, it would have hurt all.

In 1808 Robert Willan described a case where a severe allergic reaction was provoked by eating a small amount of almonds:

These symptoms were soon followed by an oedematous swelling of the face, especially of the lips and nose, which were very hot and itchy. There was at the same time an uneasy tickling sensation in the throat, which excited a troublesome cough and a constriction of the fauces, which seemed to threaten suffocation. The tongue, likewise, became enlarged and stiff, causing slowness and faltering in the speech. Soon after going to bed an eruption took place over the whole body of spots nearly as large as a sixpence, of a dead white colour, a little elevated above the skin, like weals produced by the sting of a nettle, and intolerably itching.

2 Food intolerance and the food industry

There are many such anecdotes in medical history literature. What is noteworthy is that, unlike most other disciplines where scientific research starts soon after such anecdotes, in the food intolerance area there has been a large gap between the case reports and scientific investigation of the field. This has created opportunities for many people to blame food intolerance for a wide range of unexplained disorders, and for many years food intolerance was regarded to be on the fringe of scientific enquiries. The fact that for decades the diagnosis of food intolerance relied mainly on clinical history created many opportunities for individuals and groups offering all sorts of unscientific and bizarre tests for diagnosis of food intolerance. It is only fairly recently, with the introduction of double-blind placebo-controlled food challenges, that opportunities for more scientific approaches have been created and research into this area has provided us with good quality evidence.

Just as high quality research evolved in the midst of anecdotes, the terminology in this field also evolved, and terms such as food hypersensitivity, food intolerance, food allergy and adverse reactions to food are used at times interchangeably. In the next section, some of these terms are described in more detail.

1.2 Terminology

When reading different texts in this area, it becomes evident that in the medical and scientific community, there is no single global consensus on what is food allergy and what is food intolerance. For example, there are authorities who consider coeliac disease as a type of food allergy and others who regard it as a form of food intolerance. Some may not consider it as either. Indeed, it appears that it all depends on what definition one has used. The terminology which appears to have gained credibility amongst many peers is that adopted by the European Academy of Allergology and Clinical Immunology (EAACI).¹ The distinguishing feature of this terminology is that it is based on mechanisms rather than clinical symptoms. The structure of this terminology is outlined in Fig. 1.1. Broadly, adverse reactions are divided into toxic and non-toxic reactions.

1.2.1 Toxic food reactions

In principle, these are reactions which could occur in any individuals if the dose is high enough to trigger a reaction. They are usually caused by direct action of food components without involvement of immune mechanisms. Toxic compounds which trigger such reactions can occur naturally, such as from eating a puffer fish complete with its poison sac! Or they can be contaminants of food. Although such reactions are fairly distinguishable from non-toxic food reactions in terms of mechanism, one has to be careful when diagnoses are made, since some of the symptoms may be similar.

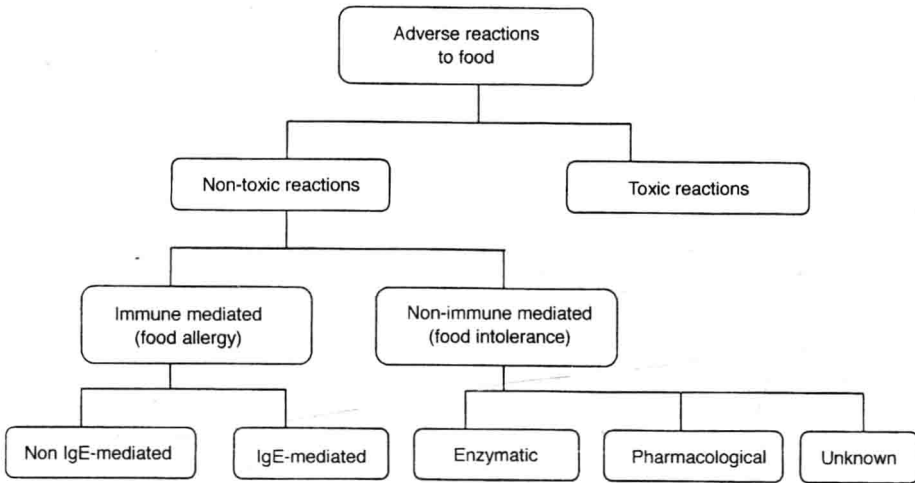


Fig. 1.1 Classification of adverse reactions to food.

1.2.2 Non-toxic food reactions

These reactions are either immune-mediated or non-immune-mediated. When the reaction is immune-mediated the term ‘food allergy’ is applied, and when non-immune-mediated the term ‘food intolerance’ is recommended. Both types of reactions are reproducible and depend on an individual’s susceptibility.

Food allergy

Food allergy itself can be subdivided into two categories, IgE-mediated food allergy and non-IgE-mediated food allergy (Fig. 1.1). Immunoglobulin (Ig) E, or IgE, is the main antibody involved in induction of immediate allergic reactions. Most of the research evidence available on food allergy has been focused on IgE-mediated food allergy. Indeed, most common food allergies are mediated by IgE antibodies. The mechanism underlying IgE-mediated food allergy is fairly well established. Symptoms of this form of food allergy appear rapidly, are varied and range from anaphylaxis to skin reactions.²

Non-IgE-mediated food allergy is less well understood. Such allergies include reactions involving other immunoglobulin isotypes such as IgG and its subclasses, food immune complexes and cell-mediated immunity. Diagnosing this form of food allergy has been difficult and none of the above-mentioned mechanisms have been proven to be causative by double-blind, placebo-controlled food challenges (DBPCFC).