Appendix 1
Glossary and abbreviations

ADHD	Attention deficit-hyperactivity disorder (*qv*)
Adrenaline	A catecholamine that occurs naturally in the body and is also used for the treatment of anaphylaxis. Also known as epinephrine
Albumin	A large water-soluble protein present in the blood
Allergen	Substance, usually a protein, capable of inducing an allergic response
Allergy	Immune response in sensitive individuals which results in an adverse reaction
Almond	Kernel from the almond tree, *Prunus amygdalis*
Anaphylaxis	Acute form of allergy characterised by urticaria (*qv*), shortness of breath, rapid fall in blood pressure and swelling of the throat and lips. Without immediate treatment, which consists of intramuscular injection of adrenaline (*qv*), anaphylaxis can be fatal
Anaphylactic shock	see Anaphylaxis
Angioedema	Presence of fluid in subcutaneous tissues or submucosa, particularly of the face, eyes, lips and sometimes tongue and throat, occurring in an anaphylactic reaction
Antibody	Immunoglobulin which is specific for an antigen or allergen
Antigen	Substance recognised by the immune system
APC	Antigen-presenting cells
Apricot	Fruit of the apricot tree, *Prunus armeniaca*
Apple	Fruit of genus Malus, usually varieties of *Malus domestica*
Arachis oil	Peanut oil
Ara h I	Peanut allergens
Ara h II	
Arthritis	see Arthropathy
Arthropathy	Painful, swollen and/or inflamed joints

Adverse reactions to food and food ingredients

Asthma	Chronic inflammatory disease of the airways which renders them prone to narrow too much. The symptoms include paroxysmal coughing, wheezing, tightness and breathlessness. Asthma may be caused by an allergic response or may be induced by non-immunological mechanisms
Atopic dermatitis	Disease of the skin characterised by itching and dry and lined skin
Atopy	Predisposition to IgE production associated with allergy to several common allergens
Attention deficit-hyperactivity disorder	Condition characterised by inattentiveness, over activity and/or impulsiveness
Aura	Peculiar sensation that precedes epilepsy or migraine. That in migraine is typically visual
Avocado	Fruit of a South American tree, *Persea americana*
Banana	Fruit of a large herbaceous plant of the genus Musa
Barley	*Hordeum vulgare*, grain-producing plant that has many uses, including manufacture of malt for beer
Birch	Trees from a large genus (Betula). Although rarely used as a food source reactions to birch antigens can be associated with allergic reactions to certain foods
Blind	In epidemiology, this term is used in relation to the knowledge the observer or the observed individual or patient has of any intervention. In a double-blind trial neither the observer nor the observed individual knows which treatment is being given. In a single blind trial only the observed individual is unaware of which treatment is being given
B lymphocyte	Bursa-equivalent lymphocytes. After maturation into plasma cells they produce antibodies (immunoglobulins) during humoral responses in immunological reactions. They were first discovered in the Bursa of Fabricius in the chicken; hence the name
Broad bean	*Vicia faba*, also known as fava bean, a cultivated member of the Leguminosae family
Capsaicin	Pungent substance present in various species of *Capsicum*; capsaicin is found in spices such as paprika and cayenne pepper
Caraway	Herb, *Carum carvi*, the dried fruit (seed) is used as a flavouring
Catfish	Large headed fish with long tactile barbils, of the order Ostariophysi

Celery	*Apium graveolens*, edible herbaceous plant
Cherry	Fruit of a number of Prunus species. The sweet cherry is *Prunus avium*
Chestnut	Nut from the Spanish or sweet chestnut tree, *Castanea sativa*
Chicken	*Gallus domesticus*, the common domesticated chicken
Chick pea	*Cicer arietinum*,Asiatic member of the Leguminosae family
Cod	Genus (Gadus) of sea fish. The Baltic cod, which has been studied for its antigenic characteristics is *Gadus callarius*; the Atlantic cod is *Gadus morhua*
Coeliac disease	Disease characterised by damage to the small intestinal wall and usually intolerance of gluten, a protein present in wheaten flour
Coriander	Herb, *Coriandrum sativum*, the fruit is used for flavouring
COT	Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment. A committee composed of independent experts which advises Government on the human health risk of chemicals in food, consumer products and the environment
Crude oil	Unrefined edible oil that may contain sufficient quantities of protein to induce an allergic reaction. May be known as "gourmet oil"
Cystitis	Inflammation of the uninary bladder, usually characterised by painful urination
Cytochrome	A class of oxidation-reduction enzymes that are principally concerned with the transfer of electrons from flavoproteins to oxygen or other electron acceptors and which employ haem as a prosthetic group
Cytokine	Mediators that are produced by a variety of cell types which influence immune and inflammatory responses
DBFC	Double-blind food challenge
DBPCFC	Double-blind placebo-controlled food challenge (*qv*)
Dermatitis	Inflammation of the skin
Dermatitis herpetiformis	Skin disease often associated with gluten-sensitive enteropathy
Disaccharidases	Enzymes catalysing the hydrolysis of disaccharides (sugars) to their constituent monosaccharides

Adverse reactions to food and food ingredients	**Double-blind placebo-controlled food challenge**	An *in vivo* test in which the patient and doctor do not know which food is being tested until after the tests and the recording of responses have been completed. Often regarded as the "gold standard" for testing for allergenicity
	Dysuria	Painful and difficult urination
	EEG	Electroencephalography
	ELISA	Enzyme linked immunosorbent assay: a sensitive technique for the detection and measurement of compounds, especially proteins
	Enkephalins	Pentapeptides, with opiate activity and marked affinity for opiate receptors, which occur naturally in the brain
	Endorphins	Proteins with marked analgesic properties, which occur naturally in the brain
	Enzymes	Proteins which catalyse chemical reactions in the body
	Enzyme polymorphism	A situation of genetic origin, where an enzyme exists in more than one form: the different forms may have different kinetic characteristics i.e. have different efficiencies at catalyzing chemical reactions
	Epinephrine	see Adrenaline
	Epitope	Peptide sequence within an antigenic molecule which is recognized by either lymphocytes or antibodies
	Fava bean	see Broad bean
	Feingold diet	Diet devised by Feingold, 1975.[251] Also called the K-P diet after the Kaiser-Permanente Medical Center, in California, where Feingold worked
	Few foods diet	Restricted diet consisting typically of meat, carbohydrate, fruit, vegetables, bottled water, sunflower oil and milk-free margarine. Often a period on such a diet is used, before sequential reintroduction of foods suspected of causing adverse reactions, see Carter *et al.*, 1993[267]
	Food additive	Substance added to food to facilitate some part of the processing or manufacture of the foodstuff or to impart a particular characteristic; they can be classified according to the purpose for which they are used into, for example, acidity regulators, antioxidants, food colours (see Appendix 4)
	Food allergy	Adverse reaction to food, mediated by immunological mechanisms
	Food colours	Substances used to impart colour to food. They can be synthetic or of natural origin (see Appendix 4)

Food intolerance	General term for adverse reaction to food and food ingredients. In this report, the term is restricted to non-immunological reactions to food and food ingredients
Gad c 1	Antigen characteristic of *Gadus callarius*, the Baltic cod
Gal d 1 (ovomucoid)	Antigens found in the eggs of chickens (*qv*)
Gal d 2 (ovalbumin)	
Gal d 3 (ovotransferrin)	
Glucose-6-phosphate dehydrogenase	Key enzyme in the pentose phosphate pathway of carbohydrate metabolism: a genetic deficiency makes certain individuals prone to develop haemolytic anaemia
Green beans	Name for certain varieties of *Phaeseolus vulgaris*
Gluten	Protein present in wheat, intolerance to a component of which is a characteristic of most cases of coeliac disease
Glycoproteins	Proteins conjugated with a carbohydrate group
GM-CSF	Granulocyte/macrophage colony-stimulating factor
GMP	Good Manufacturing Practice
Haemolytic anaemia	Type of anaemia characterised by shortened survival of red cells usually accompanied by liberation of the red cell contents into the circulation
Haricôt beans	Name for certain varieties of *Phaeseolus vulgaris*
Hazelnut	Nut from the hazel nut tree, *Corylus avellana*
Histamine	Decarboxylation product of the amino acid histidine. It is an important inflammatory mediator in allergy and in other circumstances and it is also involved in "pseudoallergy"
HLA	Human leukocyte antigen. The major human histocompatability complex. They are complex glycoproteins on the surface of cells which give us our individual immunological identity
Hypersensitivity	Heightened responsiveness induced by allergic sensitisation. There are several types of response including that associated with allergy (see immediate-type hypersensitivity)
IFN-γ	Interferon gamma, produced by Th1 and other cells, antagonises IgE antibody production
IgE	One of the five main classes of human immunoglobulin. IgE is involved in allergy and anaphylaxis as well as protecting against intestinal parasites. IgE-mediated hypersensitivity is characterised by the speedy release of mediators such as histamine

IgG	One of the five main classes of human immunoglobulin
IL	see Interleukin
Immediate-type allergy/ hypersensitivity	IgE-mediated hypersensitivity characterised by release of med-iators such as histamine
Immunogen	Substance capable of eliciting an immune response
Immunological tolerance	Specific immunological unresponsivenes or altered responsiveness resulting from exposure to antigen
Incidence	The number of new cases of a disease that occur during a particular time in a defined population
Interleukins	Soluble polypeptide mediators, produced by activated lymphocytes and other cells during immune and inflammatory response
Kidney beans	Name for certain varieties of *Phaeseolus vulgaris*
Kiwifruit	Fruit of plant native to eastern Asia, *Actinidia sinensis*, and widely cultivated in New Zealand
Latex	Product obtained from *Hevea brasiliensis*, the rubber tree. Latex is rich in terpenoids and is used in rubber production
Lentil	Bean-like seed from *Lens esculenta*, a plant of the Leguminosae family
Lupin (lupine)	Genus (*Lupinus*) of plants of the Lerguminosae family widely grown as flowering plants. The usual garden species are poisonous, but some species (*Lupinus luteus, angustifolius* and *albus*) have low alkaloid varieties and are used as whole seeds, flour or "milk" for human or animal consumption. These varieties are known as "sweet" lupins
Maize	*Zea mays*, grain producing plant, native of the Americas; sometimes known as Indian corn
Mal d 1	Antigen associated with apples
Mast cells	Cells found predominantly in connective tissue, although a specialised population of mast cells is found in mucosal sites (e.g. the gut). Following degranulation, mast cells release preformed and newly synthesised mediators of inflammation, including histamine
Methaemoglobin	Haemoglobin in which the ferrous iron (Fe^{2+}) is oxidised to ferric iron (Fe^{3+})
Methaemoglobinaemia	Situation in which abnormal quantities of methaemoglobin are present in red blood cells
Migraine	Type of headache, characterised by usually being unilateral and/or being accompanied by visual disturbance

Monkey nut	see Peanut
Monosodium glutamate	Monosodium salt of glutamic acid, an amino acid, Monosodium glutamate is used as a flavour enhancer
MSG	Monosodium glutamate
Mugwort	Plant of the Compositae family, *Artemesia vulgaris*
Mustard	Herb with a characteristic hot taste, yellow mustard is *Sinapis alba*, oriental mustard is *Brassica juncea*
Neoallergen	Allergen (*qv*) formed during the processing of food
Nut	Botanically this is defined as a hard dry indehiscent fruit, in this text the term is used in its colloquial sense as any fruit with a hard wall
Nutmeg	Spice from the dried fruit of the nutmeg tree, *Myristica fragrans*, a native of the far east
Open challenge	In the context of adverse reactions to food, challenging the patient with the food suspected to cause the adverse reaction, without any attempt to hide the nature of the challenge from the observer or the patient
Oriental mustard	see Mustard
Otitis media	Inflammation of the middle ear
Paprika	Condiment made from the ground pods of sweet peppers (*Capsicum* spp.)
Pea	Bean-like seed from *Pisum sativum*, a plant of the Leguminosae family
Peach	Fruit of the peach tree, *Prunus persica*
Peanut	Nut from a herbaceous plant. It is also known as the groundnut or monkey nut, botanical name *Arachis hypogaea*. It is a member of the Leguminosae family and thus related botanically to peas and beans, rather than tree nuts such as brazil, hazel or almond. Used in a number of foodstuffs and also used to produce peanut oil
Peanut oil	Also known as arachis oil. Used in foods and other products such as skin creams
Pear	Fruit of the pear tree, usually of varieties of the common European pear, *Pyrus communis*
Pecan nut	Nut of a North American tree (*Carya illinoensis*) of the hickory group
ß-Phenylethylamine	Decarboxylation product of the amino acid phenylalanine. ß-Phenylethylamine has sympathomimetic properties

Plum	Fruit of the plum tree, usually *Prunus domestica*
Potato	Tuber from a herbaceous plant, *Solanum tuberosum*
Prevalence	Total number of cases of a disease in existence at a certain time in a designated population (including new and old cases)
RAST	Radioallergosorbent test; a test for the measurement of specific IgE antibodies in the blood
Refined oil	Oils containing no detectable protein and therefore unlikely to cause an allergic reaction
Rhinitis	Inflammation of the nasal passages, resulting in runny nose
Rhinoconjunctivis	Rhinitis (*qv*) combined with inflammation of the conjunctiva
Rice	*Oryza sativa*, a grain-producing plant
Rye	*Secale cereale*, a grain-producing plant
St John's Wort	Herbaceous plant, *Hypericum perforatum*
Salmon	Family of fish, Salmonidae, Atlantic salmon is *Salmo salar*; many Pacific salmon belong to the genus Oncorhynchus
Scotoma	Blind area in the visual field. A scintillating scotoma combines this with a glittering or shimmering area in the visual field
Serotonin	Vasoactive decarboxylation product of the amino acid tryptophan, also known as 5-hydroxytryptamine
Sesame	Herb, native of Asia, *Sesamum indianum*, whose seeds are used as a flavouring and source of oil
Sorbital	Polyhydric alcohol, found in fruit of many members of the Rosaceae. It is a sweetening agent used in diabetic foods
Soy bean	see Soya bean
Soya bean	Bean from *Glycine maxima*, a plant of the Leguminosae family
SPT	Skin Prick Test. A clinical test of allergenic reactivity and allergenicity commonly used in allergy clinics
Swiss chard	Variety of beet (*Beta vulgaris* Cicla) eaten for its fleshy stalk
Tartrazine	Food colour, chemically it is an azo dye
T helper cells	In general, T cells which help B lymphocytes to produce antibodies. Two principle subtypes exist. Th1 cells (*qv*) produce IFN-γ amongst others cytokines and antagonise the IgE responses. Th2-type cells (*qv*) produce interleukins that promote IgE production and allergic sensitisation
T lymphocytes	Thymus-dependent lymphocytes which, amongst other functions, help B lymphocytes during immunological

	responses and provide protection from intracellular microbial infection. Distinct subpopulations have been characterised - see T helper cell
Tc cells	T cytotoxic cells
Th1 cells	T helper lymphocytes of the type 1 subgroup which produce cytokines such as IFN-γ. In general, their actions antagonise the IgE response
Th2 cells	T helper lymphocytes of the type 2 subgroup which produce cytokines that promote IgE hypersensitivity reactions
TNF-α	Tumour necrosis factor α
Tomato	Fruit of a herbaceous plant, *Lycopersicon lycopersicum*
Tyramine	Decarboxylation product of the amino acid tyramine. Tyramine has sympathomimetic properties
Urticaria	An intensely itchy rash which results from inflammation and leakage of fluid from the blood into the superficial layers of the skin in response to various mediators. Synonyms are "hives" or "nettle rash"
Walnut	Nut from trees of several species genus Juglans, the common European walnut is *Juglans regia*, the common North American one (the black walnut) is *Juglans nigra*
Wheat	*Triticum aestivum*, grain-producing plant, the flour is used for making bread
Yellow mustard	see Mustard

Appendix 2
Classification of adverse reactions to food

A2.1 Adverse reactions to food can be classified in a number of ways. This report has used an adaptation of that of the European Academy for Allergy and Clinical Immunology (see paragraphs 2.20 to 2.34 and Figure 2.1), although this is unsatisfactory in that it classifies all immunologically-mediated reactions as allergies. Two other classifications are briefly described below.

A2.2 The Joint Report of the Royal College of Physicians of London and the British Nutrition Foundation[1] divides adverse reactions to food into food aversion and food intolerance. Food aversion comprises psychological food intolerance and food avoidance. Food intolerance consists of allergic reactions, enzyme defects, pharmacological adverse reactions and fermentation of food residues, i.e. it includes both food allergy and what in the European Academy for Allergy and Clinical Immunology classification and the present report is termed food intolerance. Both classifications agree that allergy is restricted to adverse reactions to food, where there is evidence of an abnormal immunological reaction.

A2.3 The American Academy of Allergy and Clinical Immunology[2] defined an adverse reaction to food as any clinically abnormal response following ingestion of a food or food additive. Adverse reactions comprise food allergy (hypersensitivity) which is mediated immunologically, and food intolerance which are those reactions which are not immunologically mediated.

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Appendix 4
Food additives

A4.1 There are over 300 substances (colours, sweeteners and "miscellaneous" additives) listed as permitted additives for use in food under EC/UK legislation. The list is continually being updated as new additives receive safety endorsements. Others not listed in the legislation, such as enzymes, may be used for functions that fall outside the control of the legislation, e.g. as processing aids.

A4.2 A food additive is defined as "*any substance not normally consumed as a food in itself and not normally used as a characteristic ingredient of food, whether or not it has a nutritive value, the intentional addition of which to food for a technological purpose in the manufacture, processing, preparation, treatment, packaging, transport or storage of such food results, or may reasonably, be expected to result, in it or its by-products becoming directly or indirectly a component of such foods*" (Regulation 2 (1) (a) of the Miscellaneous Food Additives Regulations 1995).

A4.3 Food additives can be described as:

- **Natural:** such as the red colouring, Beetroot red, derived from beetroot juice,
- **Nature-identical:** man-made chemicals, which are identical to something found in nature, such as the flavouring vanillin, and
- **Artificial:** man-made and not found in nature, such as saccharin, a low calorie sweetener used to replace sugar.

Different classes of additives

A4.4 Food additives carry out a wide range of important functions in food. Colours such as tartrazine, amaranth, sunset yellow and carmoisine restore the colour lost from food during processing and make food look more appetising. Sweeteners such as saccharin and aspartame are used to impart a sweet taste to foodstuffs. Preservatives such as benzoates and sulfites prevent fungal and bacterial growth and therefore keep food safe longer and help to reduce wastage of food in shops and at home. Antioxidants such as butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT) are used to prolong shelf life of food by protecting it against deterioration caused by exposure to oxygen in the air, which can cause fat rancidity and colour change. Flavour enhancers such as monosodium glutamate are very widely used in savoury foods to make flavours seem stronger. Emulsifiers, such as lecithins, make it possible to mix two or more substances that would not normally mix, i.e. oil and water and stabilisers, such as pectins and gums, help to maintain this emulsion within a foodstuff. An 'E number' on a label shows that the additive has been evaluated by the EC Scientific Committee on Food and accepted as safe throughout the European Community (see list below).

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Legislation controlling the use of food additives

A4.5 All additives, whether produced from natural or man-made sources, are controlled by means of the same legislation. Moreover, regardless of their provenance, all undergo the same stringent approval procedures and are only permitted for use if they are considered necessary and safe following scrutiny by independent experts.

A4.6 Preservatives, antioxidants and most other categories of food additives (other than colours and sweeteners) are controlled in Great Britain under the Miscellaneous Food Additives Regulations 1995 (SI 1995/3187) (as amended). Parallel provisions exist in Northern Ireland. These Regulations implement the provisions of EC legislation in this area, and restrict the use of certain additives to specified foods and at maximum specified levels. Others are permitted at *quantum satis* (in line with good manufacturing practice) level in processed foods.

A4.7 Colours and sweeteners are controlled in Great Britain under the Colours in Food Regulations 1995 (SI 1995/3124) and the Sweeteners in Food Regulations 1995 (SI 1995/3123), respectively, which implement EC provisions in this area. Parallel provisions also exist in Northern Ireland. These Regulations restrict the use of most colours and sweeteners to specified foods and at maximum specified levels.

A4.8 The use of food additives is prohibited or severely restricted in certain foods, e.g. unprocessed foods, or those specially prepared for infants and young children under 36 months of age.

E numbers

List of permitted additives subject to regulatory control

E Number	Name
E 100	Curcumin
E 101	(i) Riboflavin
	(ii) Riboflavin-5'-phosphate
E 102	Tartrazine
E 104	Quinoline Yellow
E 110	Sunset Yellow FCF
	Orange Yellow S
E 120	Cochineal, Carminic acid, Carmines
E 122	Azorubine, Carmoisine
E 123	Amaranth
E 124	Ponceau 4R, Cochineal Red A
E 127	Erythrosine
E 128	Red 2G
E 129	Allura Red AC
E 131	Patent Blue V
E 132	Indigotine, Indigo carmine

List of permitted additives subject to regulatory control (continued)

E Number	Name
E 133	Brilliant Blue FCF
E 140	(i) Chlorophylls
	(ii) Chlorophyllins
E 141	(i) Copper complexes of chlorophylls
	(ii) Copper complexes of chlorophyllins
E 142	Green S
E 150a	Plain caramel
E 150b	Caustic sulphite caramel
E 150c	Ammonia caramel
E 150d	Sulphite ammonia caramel
E 151	Brilliant Black BN, Black PN
E 153	Vegetable carbon
E 154	Brown FK
E 155	Brown HT
E 160a	(i) Mixed carotenes
	(ii) Beta-carotene
E 160b	Annatto, bixin, norbixin
E 160c	Paprika extract, capsanthin, capsorubin
E 160d	Lycopene
E 160e	Beta-apo-8'-carotenal (C 30)
E 160f	Ethyl ester of beta-apo-8'-carotenic acid (C 30)
E 161b	Lutein
E 161g	Canthaxanthin
E 162	Beetroot Red, betanin
E 163	Anthocyanins
E 170	Calcium carbonates
	(i) Calcium carbonate
	(ii) Calcium hydrogen carbonate
E 171	Titanium dioxide
E 172	Iron oxides and hydroxides
E 173	Aluminium
E 174	Silver
E 175	Gold
E 180	Litholrubine BK
E 200	Sorbic acid
E 202	Potassium sorbate
E 203	Calcium sorbate
E 210	Benzoic acid
E 211	Sodium benzoate
E 212	Potassium benzoate
E 213	Calcium benzoate
E 214	Ethyl *p*-hydroxybenzoate
E 215	Sodium-ethyl *p*-hydroxybenzoate
E 216	Propyl *p*-hydroxybenzoate

Adverse reactions to food and food ingredients

List of permitted additives subject to regulatory control (continued)

E Number	Name
E 217	Sodium propyl *p*-hydroxybenzoate
E 218	Methyl *p*-hydroxybenzoate
E 219	Sodium methyl *p*-hydroxybenzoate
E 220	Sulphur dioxide
E 221	Sodium sulphite
E 222	Sodium hydrogen sulphite
E 223	Sodium metabisulphite
E 224	Potassium metabisulphite
E 226	Calcium sulphite
E 227	Calcium hydrogen sulphite
E 228	Potassium hydrogen sulphite
E 230	Biphenyl, diphenyl
E 231	Orthophenyl phenol
E 232	Sodium orthophenyl phenol
E 233	Thiabendazole
E 234	Nisin
E 235	Natamycin
E 239	Hexamethylene tetramine
E 242	Dimethyl dicarbonate
E 249	Potassium nitrite
E 250	Sodium nitrite
E 251	Sodium nitrate
E 252	Potassium nitrate
E 260	Acetic acid
E 261	(i) Potassium acetate
E 262	Sodium acetates
	(i) Sodium acetate
	(ii) Sodium hydrogen acetate (sodium diacetate)
E 263	Calcium acetate
E 270	Lactic acid
E 280	Propionic acid
E 281	Sodium propionate
E 282	Calcium propionate
E 283	Potassium propionic acid
E 284	Boric acid
E 285	Sodium tetraborate (borax)
E 290	Carbon dioxide
E 296	Malic acid
E 297	Fumaric acid
E 300	Ascorbic acid
E 301	Sodium ascorbate
E 302	Calcium ascorbate
E 304	Fatty acid esters of ascorbic acid
	(i) Ascorbyl palmitate
	(ii) Ascorbyl stearate

List of permitted additives subject to regulatory control (continued)

E Number	Name
E 306	Tocopherol-rich extract
E 307	Alpha-tocopherol
E 308	Gamma-tocopherol
E 309	Delta-tocopherol
E 310	Propyl gallate
E 311	Octyl gallate
E 312	Dodecyl gallate
E 315	Erythorbic acid
E 316	Sodium Erythorbate
E 320	Butylated hydroxyanisole (BHA)
E 321	Butylated hydroxytoluene (BHT)
E 322	Lecithins
E 325	Sodium lactate
E 326	Potassium lactate
E 327	Calcium lactate
E 330	Citric acid
E 331	Sodium citrates
	(i) Monosodium citrate
	(ii) Disodium citrate
	(iii) Trisodium citrate
E 332	Potassium citrates
	(i) Monopotassium citrate
	(ii) Tripotassium citrate
E 333	Calcium citrates
	(i) Monocalcium citrate
	(ii) Dicalcium citrate
	(iii) Tricalcium citrate
E 334	Tartaric acid (L(+) -)
E 335	Sodium tartrates
	(i) Monosodium tartrate
	(ii) Disodium tartrate
E 336	Potassium tartrates
	(i) Monopotassium tartrate
	(ii) Dipotassium tartrate
E 337	Sodium potassium tartrate
E 338	Phosphoric acid
E 339	Sodium phosphates
	(i) Monosodium phosphate
	(ii) Disodium phosphate
	(iii) Trisodium phosphate
E 340	Potassium phosphates
	(i) Monopotassium phosphate
	(ii) Dipotassium phosphate
	(iii) Tripotassium phosphate

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List of permitted additives subject to regulatory control (continued)

E Number	Name
E 341	Calcium phosphates
	(i) Monocalcium phosphate
	(ii) Dicalcium phosphate
	(iii) Tricalcium phosphate
E 350	Sodium malates
	(i) Sodium malate
	(ii) Sodium hydrogen malate
E 351	(i) Potassium malate
E 352	Calcium malates
	(i) Calcium malate
	(ii) Calcium hydrogen malate
E 353	Metatartaric acid
E 354	Calcium tartrate
E 363	Succinic acid
E 380	Triammonium citrate
E 385	Calcium disodium ethylenediaminetetra-acetate
E 400	Alginic acid
E 401	Sodium alginate
E 402	Potassium alginate
E 403	Ammonium alginate
E 404	Calcium alginate
E 405	Propane-1,2-diol alginate
E 406	Agar
E 407	Carrageenan
E 410	Locust bean gum
E 412	Guar gum
E 413	Tragacanth
E 414	Acacia gum (gum arabic)
E 415	Xanthan gum
E 416	Karaya gum
E 417	Tara gum
E 418	Gellan gum
E 420	Sorbitol
	(i) Sorbitol
	(ii) Sorbitol syrup
E 421	Mannitol
E 422	Glycerol
E 431	Polyoxyethylene (40) stearate
E 432	Polyoxyethylene sorbitan monolaurate (polysorbate 20)
E 433	Polyoxyethylene sorbitan monooleate (polysorbate 80)
E 434	Polyoxyethylene sorbitan monopalmitate (polysorbate 40)
E 435	Polyoxyethylene sorbitan monostearate (polysorbate 60)
E 436	Polyoxyethylene sorbitan tristearate (polysorbate 65)

List of permitted additives subject to regulatory control (continued)

E Number	Name
E 440	Pectins
	(i) pectin
	(ii) amidated pectin
E 442	Ammonium phosphatides
E 444	Sucrose acetate isobutyrate
E 445	Glycerol esters of wood rosins
E 450	Diphosphates
	(i) Disodium disphosphate
	(ii) Trisodium disphosphate
	(iii) Tetrasodium diphosphate
	(iv) Dipotassium diphosphate
	(v) Tetrapotassium diphosphate
	(vi) Dicalcium diphosphate
	(vii) Calcium dihydrogen diphosphate
E 451	Triphosphates
	(i) Pentasodium triphosphate
	(ii) Pentapotassium triphosphate
E 452	Polyphosphates
	(i) Sodium polyphosphate
	(ii) Potassium polyphosphate
	(iii) Sodium calcium polyphosphate
	(iv) Calcium polyphosphates
E 460	Cellulose
	(i) Microcrystalline cellulose
	(ii) Powdered cellulose
E 461	Methyl cellulose
E 463	Hydroxypropyl cellulose
E 464	Hydroxypropyl methyl cellulose
E 465	Ethyl methyl cellulose
E 466	Carboxyethyl cellulose
	Sodium carboxymethyl cellulose
E 469	Enzymatically hydrolysed carboxymethyl cellulose
E 470(a)	Sodium, potassium and calcium salts of fatty acids
E 470(b)	Magnesium salts of fatty acids
E 471	Mono- and diglycerides of fatty acids
E 472(a)	Acetic acid esters of mono- and diglycerides of fatty acids
E 472(b)	Lactic acid esters of mono- and diglycerides of fatty acids
E 472(c)	Citric acid esters of mono- and diglycerides of fatty acids
E 472(d)	Tartaric acid esters of mono- and diglycerides of fatty acids
E 472(e)	Mono- and diacetyl tartaric acid esters of mono- and diglycerides of fatty
E 472(f)	Mixed acetic and tartaric acids esters of mono- and diglycerides of fatty
E 473	Sucrose esters of fatty acids
E 474	Sucroglycerides
E 475	Polyglycerol esters of fatty acids

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List of permitted additives subject to regulatory control (continued)

E Number	Name
E 476	Polyglycerol polyricinoleate
E 477	Propane-1,2-diol esters of fatty acids
E 479(b)	Thermally oxidized soya bean oil
E 481	Sodium stearoyl-2-lactylate
E 482	Calcium stearoyl-2-lactylate
E 483	Stearyl tartrate
E 490	Propan-1,2-diol (propylene glycol)
E 491	Sorbitan monostearate
E 492	Sorbitan tristearate
E 493	Sorbitan monolaurate
E 494	Sorbitan monooleate
E 495	Sorbitan monopalmitate
E 500	Sodium carbonates
	(i) Sodium carbonate
	(ii) Sodium hydrogen carbonate
	(iii) Sodium sesquicarbonate
E 501	Potassium carbonates
	(i) Potassium carbonate
	(ii) Potassium hydrogen carbonate
E 503	Ammonium carbonates
	(i) Ammonium carbonate
	(ii) Ammonium hydrogen carbonate
E 504	Magnesium carbonates
	(i) Magnesium carbonate
	(ii) Magnesium hydroxide carbonate
	(synonym: Magnesium hydrogen carbonate)
E 507	Hydrochloric acid
E 508	Potassium chloride
E 509	Calcium chloride
E 511	Magnesium chloride
E 512	Stannous chloride
E 513	Sulphuric acid
E 514	Sodium sulphates
	i) Sodium sulphate
	(ii) Sodium hydrogen sulphate
E 515	Potassium sulphates
	(i) Potassium sulphate
	(ii) Potassium hydrogen sulphate
E 516	Calcium sulphate
E 517	Ammonium sulphate
E 520	Aluminium sulphate
E 521	Aluminium sodium sulphate
E 522	Aluminium potassium sulphate
E 523	Aluminium ammonium sulphate

List of permitted additives subject to regulatory control (continued)

E Number	Name
E 524	Sodium hydroxide
E 525	Potassium hydroxide
E 526	Calcium hydroxide
E 527	Ammonium hydroxide
E 528	Magnesium hydroxide
E 529	Calcium oxide
E 530	Magnesium oxide
E 535	Sodium ferrocyanide
E 536	Potassium ferrocyanide
E 538	Calcium ferrocyanide
E 541	Sodium aluminium phosphate
E 551	Silicon dioxide
E 552	Calcium silicate
E 553(a)	(i) Magnesium silicate
	(ii) Magnesium trisilicate
E 553(b)	Talc
E 554	Sodium aluminium silicate
E 555	Potassium aluminium silicate
E 556	Calcium aluminium silicate
E 558	Bentonite
E 559	Aluminium silicate (Kaolin)
E 570	Fatty acids
E 574	Gluconic acid
E 575	Glucono-delta-lactone
E 576	Sodium gluconate
E 577	Potassium gluconate
E 578	Calcium gluconate
E 579	Ferrous gluconate
E 585	Ferrous lactate
E 620	Glutamic acid
E 621	Monosodium glutamate
E 622	Monopotassium glutamate
E 623	Calcium diglutamate
E 624	Monoammonium glutamate
E 625	Magnesium diglutamate
E 626	Guanylic acid
E 627	Disodium guanylate
E 628	Dipotassium guanylate.
E 629	Calcium guanylate
E 630	Inosinic acid
E 631	Disodium inosinate
E 632	Dipotassium inosinate
E 633	Calcium inosinate
E 634	Calcium 5'-ribonucleotides

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List of permitted additives subject to regulatory control (continued)

E Number	Name
E 635	Disodium 5'-ribonucleotides
E 640	Glycine and its sodium salt
E 900	Dimethyl polysiloxane
E 901	Bees wax, white and yellow
E 902	Candelilla wax
E 903	Carnauba wax
E 904	Shellac
E 912	Montan acid esters
E 914	Oxidized polyethylene wax
E 920	L-Cysteine
E 925	Chlorine
E 926	Chlorine dioxide
E 927(b)	Carbamide
E 938	Argon
E 939	Helium
E 941	Nitrogen
E 942	Nitrous oxide
E 948	Oxygen
E 950	Acesulfame K
E 951	Aspartame
E 952	Cyclamic acid (and its Na and Ca salts)
E 953	Isomalt
E 954	Saccharin
E 957	Thaumatin
E 959	Neohesperidine DC
E 965	Maltitol
	(i) Maltitol
	(ii) Maltitol syrup
E 966	Lactitol
E 967	Xylitol
E 999	Quillaia extract
E 1103	Invertase
E 1105	Lysozyme
E 1200	Polydextrose
E 1201	Polyvinylpyrrolidone
E 1202	Polyvinylpolypyrrolidone
E 1404	Oxidized starch
E 1410	Monostarch phosphate
E 1412	Distarch phosphate
E 1413	Phosphated distarch phosphate
E 1414	Acetylated distarch phosphate
E 1420	Acetylated starch
E 1422	Acetylated distarch adipate
E 1440	Hydroxypropyl starch

List of permitted additives subject to regulatory control (continued)

E Number	Name
E 1442	Hydroxypropyl distarch phosphate
E 1450	Starch sodium octenyl succinate
E 1451	Acetylated oxidised starch
E 1505	Triethyl citrate
E 1518	Glyceryl triacetate (triacetin)
	Propane
	Butane
	iso-Butane
	alpha-Amylases
	Proteinases
	Hemicellulases

Extraction Solvents

1	Propane
2	Butane
3	Butyl acetate
4	Ethyl acetate
5	Ethanol
6	Carbon dioxide
7	Acetone
8	Nitrous oxide
9	Methanol
10	Propan-2-ol
11	Hexane
12	Methyl acetate
13	Ethylmethylketone
14	Dichloromethane
15	Diethyl ether
16	Butan-1-ol
17	Butan-2-ol
18	Methyl-propan-1-ol - *going soon*)
19	Propan-1-ol
20	Cyclohexane
21	1,1,1,3-Tetrafluoroethane - *coming soon*)

Appendix 5
Food labelling

A5.1 One of the main concerns of sufferers from food allergies is that they need to avoid the foods to which they are allergic. However, obtaining food free of the ingredient(s) which they need to avoid is often very difficult. This is a particular problem in the case of allergens such as those in tree nuts and peanuts, where a minute trace of the allergen may cause a severe or even fatal reaction. Here, sufferers will require complete certainly that they are avoiding the offending material; for a variety of reasons this is difficult to attain.

Pre-packaged food

A5.2 The rules on labelling for pre-packaged foods are largely harmonized at European Community level (EC, 1997) and the law requires ingredients and most additives to be listed in order of their weight in that food, when it was being prepared. However, there are certain exemptions from ingredient listing, which could, in certain circumstances, prevent customers from identifying the ingredients they need to avoid from the information on the label. Thus, in the case of pre-packaged foods, there is no requirement for manufacturers to label ingredients if they constitute less than 25% of the final food. An example would be the biscuit base of a dessert, where, if nuts were used in the biscuit base, they would not have to be listed in the ingredients, provided the biscuit base constituted less than 25% of the whole dessert. Many manufacturers are now choosing voluntarily to waive this rule in the case of recognised antigens. A further problem is provided by the practice of generic labelling, whereby a manufacturer may use a generic expression such as "vegetable oil". In such cases the oil may have many different sources and may for example contain peanut oil. Furthermore, there is the practice often referred to as "defensive labelling", where the manufacturer will indicate that a product "may contain nuts", even when they are unlikely to be present, in order to protect the manufacturer against the possibility of the product having been accidentally contaminated. In the context of defensive labelling food manufacturers and retailers have recently produced guidelines for the use of nuts in food manufacture and discussions with Government are continuing to ensure that the genuine concerns of industry about the legal liability of manufacturers and retailers should not override the needs of sufferers to be able to choose from a reasonable range of foods. Defensive labelling should only be used if, after good manufacturing practice and a full hazard analysis to eliminate the possibility of seriously allergenic material being present, there is still thought to be a genuine risk to the consumer with food allergy.

A5.3 Food allergy sufferers can obtain product information from most major retailers, who now produce lists of products which are allergen-free. The Leatherhead Food Research Association has established a data bank which provides lists of foods from certain ingredients to registered dieticians. The data bank does not cover all allergenic materials and, in particular, does not include tree nuts or peanuts because of the difficulty of providing assurance that a product is free of tree nut or peanut protein down to the very low levels that would be

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required. Efforts are being made to improve the data bank and discussions are under way to make it more freely available.

Unpackaged foods and foods available through catering outlets

A5.4 One of the greatest risk areas for food allergy sufferers is eating foods sold unpackaged and also foods available through catering outlets, because in such circumstances there is no legal requirement for products to carry lists of ingredients. The Ministry of Agriculture, Fisheries and Food (MAFF) launched an initiative in 1997 to increase awareness within the catering industry of severe allergy and the risks of anaphylaxis; MAFF also provided advice on how to avoid cross contamination of products and is working to see what more can be done to increase awareness in the area. Caterers need to be conscious of the serious nature of the problem and to know whether materials prone to give rise to allergic reactions are present or likely to be present in products. Moreover, consumers need to be encouraged to ask about the ingredients in the foods they wish to purchase or consume.

Reference

EC (1997). Council Directive 79/112/EEC on the approximation of the laws of the member states relating to labelling, presentation and advertising of foodstuffs as last amended by the European Parliament and Council Directive 97/4/EC.

Appendix 6
List of those who made written submissions to the Working Group

Date	Name of individual/ organisation	Title
07/05/1996	Dr Harold Fore 7 The Ceal Stockport, Cheshire	'Irritable Bowel Syndrome and Certain Surfactants'.
26/11/1996	Mrs I D Colquhoun Hyperactive Children's Support Group	Enclosures: Questionnaires, HACSG Database, Attention Deficit/Hyperactive Disorder, Medical Hypotheses, The American Journal of Clinical Nutrition, Omega-3 Fatty Acids in Boys with Behaviour, Learning and Health Problems, Efamol, Fatty Acid Analysis in Blood from Violent Offenders, Letter from the All Parliamentary Group for Children
?/02/1997	Mrs I D Colquhoun Hyperactive Children's Support Group	Journal article entitled 'Food, Brain and Behaviour' from the Journal of Nutritional and Environmental Medicine
06/06/1997	Mrs I D Colquhoun Hyperactive Children's	Information from HACSG Support Group
30/10/1997	Dr Harold Fore 7 The Ceal Stockport, Cheshire	Addendum to previous submission of 7/5/96 entitled 'Irritable Bowel Syndrome and Certain Surfactants'
?/11/1997	Mrs I D Colquhoun Hyperactive Children's Support Group	Paper entitled 'Assessment of Chemical Factors in relation to Child Hyperactivity' from the Journal of Nutritional and Environmental Medicine, vol.7 no.4
24/11/1997	Dr Steve Britton Consultant Paediatrician Good Hope Hospital Sutton Coldfield	Letter with comments about food intolerance and labelling
?/12/1997	Jonathan Brostoff Professor of Allergy and Environmental Health Allergy Clinic Middlesex Hospital	Abstract of a "Food, Brain & Behaviour" meeting held by the 'Allergy Research Foundation' in October 1996
?/12/1997	British Society for Allergy, Environmental and Nutritional Medicine	Food Allergy and Intolerance

Date	Name of individual/ organisation	Title
?/03/1998	Brewing Research International Lyttel Hall Nutfield, Surrey	Investigations into the occurrence of 3-mono chloropropanediol (3-MCPD) in malts and malt extracts
26/03/1998	Mrs I D Colquhoun Hyperactive Children's Support Group	Copy of latest HACSG journal and a booklet on Zinc Deficiency
?/10/1998	Mrs I D Colquhoun Hyperactive Children's Support Group	Papers on Cows Milk Allergy in Hyperactive Children, the Adverse effects of Zinc Deficiency and the effects of Azodyes on Hyperactive Children
?/04/1999	Mrs I D Colquhoun Hyperactive Children's Support Group	Excerpt from the latest HASCG journal, and a Scotland on Sunday article on Ritalin Abstracts of three research papers entitled "Foods and additives are common causes of the attention deficit hyperactivity disorder in children" "Physical signs and symptoms in pre-school-age hyperactive and normal children" and "Synthetic food colouring and behaviour: a dose response effect in a double-blind, placebo-controlled, repeated-measures study"

List of those who commented on the draft report following the consultation exercise

Date	Name of individual/organisation
20/02/2000	Professor Maurice Lessof
20/02/2000	Mrs Judy Brander
20/02/2000	Dr J Buttriss (British Nutrition Foundation)
21/02/2000	Mrs I D Colquhoun
24/02/2000	Mr Harold Fore
25/02/2000	Dr Richard Pumphrey (Central Manchester Healthcare NHS Trust)
01/03/2000	Dr Leigh Gibson (Royal Free & University College Medical School)
14/03/2000	Professor Jean A Monro (Breakspear Hospital)
15/03/2000	Mr John Murray (National Association of British & Irish Millers)
15/03/2000	Ms Sarah Jacobs (Infant and Dietetic Foods Association)

Appendix 7
Membership of the Food Intolerance Working Group

Chairman

Professor P J Aggett MB ChB FRCP MSc DCH FRCPCH

Members

Professor A D Dayan BSc MD FRCPath FFOM FFPM CBiol FIBiol
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Professor S Strobel MD PhD FRCP FRCPCH
Professor E Taylor BA MA MBChir MRCP MRCPsych FRCP FRCPsych
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Secretariat

D E Aldridge BSc PhD Cbiol MIBiol (*Scientific Secretary*, until October 1997)
TC Marrs MD DSc MRCP FRCPath FIBiol FATS DRCPath(Tox)
(*Medical and Scientific Secretary*, from January 1998)
J L Lighthill BA (*Administrative Secretary*)

Assessor

C E Fisher MA DPhil Chem FRSC FIFST

Observers

J B Greig MA DPhil (*Scientific Secretary*, October 1997 until January 1998)
A Wadge BSc PhD CBiol MBiol

Appendix 8
Membership of the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment

Chairman

Professor H F Woods BSc BM BCh DPhil FFPM FRCP (Lond. & Edin.)

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Professor N A Brown BSc PhD
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