1996

Allergenic Foods

Susan L. Hefle
University of Nebraska-Lincoln

Julie A. Nordlee
University of Nebraska–Lincoln, jnordlee1@unl.edu

Steve L. Taylor
University of Nebraska-Lincoln, staylor2@unl.edu

Published in *Critical Reviews in Food Science and Nutrition* 36(S) (1996), pp. S69–S89; doi: 10.1080/10408399609527760

Published online September 29, 2009.

Allergenic Foods

Susan L. Hefle, Julie A. Nordlee, and Steve L. Taylor

Food Allergy Research and Resource Program, Department of Food Science, University of Nebraska–Lincoln, Lincoln, Nebraska, USA

Susan L. Hefle is formerly of the William S. Middleton VA Hospital and Department of Medicine and Food Research Institute, University of Wisconsin, Madison, Wisconsin.

I. Introduction

Virtually all food allergens are proteins, although only a small percentage of the many proteins in foods are allergens.[1] Any food that contains protein has the potential to cause allergic reactions in some individuals. However, a few foods or food groups are known to cause allergies on a more frequent basis than other foods. At a 1995 consultation on food allergies sponsored by the Food and Agriculture Organization (FAO), a group of international experts confirmed that peanuts, soybeans, crustacea, fish, cow's milk, eggs, tree nuts, and wheat are the most common allergenic foods.[2] These foods are responsible for more than 90% of serious allergic reactions to foods. Allergies to certain fresh fruits and vegetables are also rather common, but the allergens tend to be labile to processing and cooking and the symptoms are mild and confined primarily to the oropharyngeal area.[3] The prevalence of allergic sensitivities to specific foods varies from one country to another depending on the frequency with which the food is eaten in that country and the typical age at its introduction into the diet. For example, peanuts are a much more frequent cause of food allergies in the United States than in most other countries. Americans eat peanuts more often and introduce peanut butter into the diet of children at an early age. The Japanese probably experience more soybean and rice allergies than some other cultures because of the frequency of these two foods in the Japanese diet.[2] Scandinavians have a high incidence of codfish allergy[4] for similar reasons.

Table 1 provides a listing of the most common allergenic foods and food groups compiled from a thorough search of the medical literature. Too many studies have been conducted to allow citation of the entire body of medical literature; citations reflect the most relevant studies documenting the allergenicity of those foods. Such hallmark studies have comparatively large groups of patients and use the most objective diagnostic criteria, such as double-blind, placebo-controlled food challenge trials (DBPCFC). For some of the individual foods within an allergenic food group, only a few published accounts of allergic reactions can be found. For example, allergic reactions to certain tree nuts, such as pistachio or macadamia, are rarely reported, probably because of less frequent consumption.

Table 1. Common Allergenic Foods and Food Groups

Food	Reference
Crustacea (shrimp, lobster, crab)	26, 39, 45, 46, 51, 143, 145, 156, 199, 253
Egg	23, 26, 27, 35, 36, 67, 101, 172, 173, 199, 200, 201, 202, 203
Fish	1, 35, 36, 78, 84, 86, 101, 126, 128, 161, 198, 199, 200, 201, 202, 253
Milk	23, 26, 27, 35, 36, 79, 101, 172, 173, 175, 198, 199, 200, 201, 202, 203, 211
Peanuts	17, 25, 26, 27, 35, 101, 117, 198, 199, 200, 201, 202, 203, 254, 255
Soybeans	17, 23, 25, 27, 101, 198, 199, 200, 201, 202, 203, 255
Tree nuts	3, 5, 7, 8, 13, 14, 16, 18, 26, 27, 30, 62, 63, 65, 77, 93, 94, 102, 103, 141, 155, 165, 173, 181, 190, 204, 214, 237
Wheat	4, 11, 12, 26, 35, 36, 51,101, 117, 120, 198 , 199, 200, 201, 202, 203

Note: This table was compiled using literature searches of the Agricola (1972 to July 1994) and Medline (1966 to July 1994) databases.

Table 2 provides a listing of the less common allergenic foods. Only some of the foods listed in this table have been documented to cause severe, life-threatening allergic reactions. Citations are provided to studies and/or case reports that document the allergenicity of those particular foods. The absence of a particular food on this list may not mean that it is nonallergenic but may indicate that its allergenicity has not been documented. Conversely, the presence of a specific food on the list merely indicates that it has been listed in one or more reports as a cause of food allergy and does not indicate the prevalence or potential as an allergenic food.

Obviously, considerable differences exist in the quality of the information used to establish the allergenicity of each specific food appearing in Table 2. Supporting data range from highly objective DBPCFCs to anecdotal reports based primarily on clinical histories. Reports were not included in the summary if they were based on histories of controversial symptoms not widely acknowledged as being caused by allergic reactions to foods, or if the supporting clinical data were based solely on controversial diagnostic techniques. Table 2 provides information on symptoms, age of patients, and the supportive diagnostic data provided in those reports.

The variability in symptoms is quite large both between individual patients and between different studies (groups of patients). Even individual patients display variable responses depending on such factors as the exposure dose to the offending food. Certainly, some symptoms are more serious than others. Systemic anaphylaxis, asthma, and

laryngeal edema are potentially life-threatening. Some foods are primarily associated with mild adverse reactions, such as the so-called oral allergy syndrome, which is associated with itching, hives, and other mild reactions in the oropharyngeal area only after ingestion of fresh fruits, and only rarely with systemic reactions.[3]

DBPCFCs represent the most objective diagnostic approach to establish a cause-and-effect relationship between ingestion of a food and an allergic reaction.[5] Other types of challenge studies, such as the single-blind and open, are also useful but are somewhat less objective than the DBPCFC. Challenge trials establish a cause-and-effect relationship between ingestion of the food and the onset of symptoms in a sensitized individual. However, they do not establish an allergic mechanism behind the illness.

Table 2 also provides information relating to results of skin tests, immunoassays, and histamine release tests that do provide evidence of an IgE-mediated allergic mechanism for the illness. However, these tests alone are insufficient to establish a cause-and-effect relationship because false positives, and to a lesser extent, false negatives do occur.[6]

Please note that the bibliography for this section of text follows the list of references.

Table 2. Less Common Allergenic Foods and Food Groups[a]

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Abalone	A, CO, DY, FL, PR (with exercise)	19		1+	0+	PH 1+ (after exercise)	51
		16–42		5+	7+		39
Acacia gum	I			1+			196
	TT, U, W	39		1+			252
Allspice	CD, DM, EX, PM	11–87		26+			166
Amaranth	A, AE, BR, H, U			1+	1+		147
Amaranth dye	AE or UC		Single; 2+				148
	AS		Double; 0+				245
	AE, UC		Open; 5+				150
Anise		48			1+		88
						IB 1+	129
				46+	23+		213
	AE, DY	26	Open; 1+	1+			214
						IB 1+	231
Annatto	AE,UC		Open; 15+				150
	AE, UC	8–72	Single; 10+				106
	A, AE, H, PR, U	62					169

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Apple	AE, CJ, I (hands), RN			8+			5
				20+	18+		20
		4–18		157+			55
	AE, I (oral, palms), RN			39+			83
	I (eyes, nasal), LE, W	48			1+		88
	AE, BR, D, H, RN,U, V	> 10	Double; 2+	9+			117
		6–41		51+ ("Apple")			121
				32+ (Granny Smith)			
				34+ (Sturmer)			
				16+ ("Pun-kanoli")			
	AE, I (oral)	10–61		36+	32+		177
	D, DI, H, N, V	13		1+	0+	PK 1+	187
	I (hands), OI, SW (hands)	24		1+			228
	A, AE, AS	25		1+	1+		237
	AE	28		1+			247
	AE, DY, PR (palms), U (with exercise)	12	Open; 1+	1+	1+		9
Aspergillus niger	HA, N, V	28	Open; 1+				92
	HA	50					92
	AS	27	Open; 1+				92
Avocado	AC, BR, U				1+		42
	BR			1+	1+		125
Balsam of Peru	EX (hands)			1+ (patch)			116
				1+ (patch)			132
	AE, AS, D, U, V	24–62		6+ (patch)			222
	EX		Open; 9+				232

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Banana	AE, D, I (throat), U, V, W	5–75		6+			6
	CU, GI, RC		Double; 1+				26
	AC, BR, U	30			1+		42
	A, AE, I (mouth), D, RN, S, U	17–32		3+	0+	HR 2+	63
	AE	28		1+			66
	A, AE, DY, U	53, 56		2+	2+		72
	A,U	67		1+	1+		125
	A, AE, I (throat), U, V, W	15		1+	1+	PK 1+	126
	AE, LV, PP, RN, W	56	Open; 1+	1+	1+	IB 1+	155
	AE, I (oral)	10–61		2+			177
	AE	44	Open; 1+	1+			158
	AE, LV	28, 30		2+	2+	HR 2+	190
	A, AE, DY, U	32		1+	1+		205
	I (pharyngeal), RN	33				EL 1+	239
Barley				3+	3+		53
	A, EX, W	10	Double; 1+				101
	AS, GI, U				8+		217
	AE, PR, VC (with exercise)	16		1+	1+	BC 1–	12
Beans	AS	20–22		2+	0		73
Garbanzo	A, AE, W	39		1+			78
	AS, CO, DY, RN	20		1+	1+	BC 1+	140
Green	AD, AS, RN		Double; 0+	9+			17
		20		1+	1+	HR 1+	140
	I (eyes), U	42	Double; 1+	1+			180
	AC, AD, AS, N, RN, V	0.33–24		7+			202
	I (eyes, nasal), RN, S	46		1+	1+	BC 1+; HR 1+	182
Kidney		23			1+		113
Lima	H, LE, W		Double; 0+	13+			17
Pinto	A, AE, U	37		1+		HR 1+	78
Sprouts—taugeh	AE, U	22		1+	1+	HR 1+	229

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Beef	DY, H, LE, W	3–27		2+			199
	AD, CU, GI, RC	0.5–25	Double; 9+				200
	AD, AP, AS, N, RN, V	0.33–24	Double; 2+	18+			202
	AD, CU, GI, RC	0.75–24	Double; 0+	4+			35
Cooked	CMA		Double; 3+				246
Less cooked	CMA		Double; 3+				246
Beer	I (facial), U			1+			227
Beta-carotene	AE,UC	8–72	Single; 10+				106
Broccoli		21		1+			21
Buckwheat	A, I (throat), TP, U	38		1+	1+		48
	A			1+		EL 1+, IB 1+	162
Cabbage	A, AE, DY	21		1+	1+		21
				1+			178
Caraway	AD, GP, RN	1–47		31+	5+		167
Cardamom	CD, OM, EX, PM	11–87	Single; 1+	4+			166
Carrot		4–18		150+			55
	AE			20+			83
	I, TS, W	48		1+	1+		88
				2+	2+		90
	LE, OAS	19–20		2+		EL 2+	105
	I, SW	24		1+			228
		34		1+			115
	AE, BR, D, H, N, RN, U, V	> 10	Double; 3+	9+	1+		117
		6–41		46+			121
	BR, LE					IB 1+	129
	A, RCJ, U	41		1+	1+		159
	AE, I (oral)	10–61		13+	6+		177
		11–50		28+			250
	A				1+		250
Cassia				10+ (patch)			132
		52		1+ (patch)			54
Cassia oil	OI, PU (lips), ST	39		1+ (patch)			209

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Cauliflower		21		1+			21
		Child		1+			178
Celery	AE	50		1+			19
	C, H, TN, U	55	Open; 1+	1+			68
	I, LE, TN, W	48			1+		88
	A, GI, LE, OAS	19–53		4+		EL 4+	105
	A, AE, U	18–55		14+		PK 2+	114
	AE, P	22			1+		124
	BR, LE					IB 1+	129
	A, AE, RC, U	14–49		20+	17+		183
	A, AE, RCJ, U	14–49		9+	9+		184
	A, H	66		1+			193
				70+			213
	AE, DY, H, LE, U	34	Open; 1+	1+			214
	A, EX, U				7+		230
	AE, DY, H, LE, U	23	Open; 1+	1+			214
				36+	36+	IB 21+	224
	A	50		1+	1+		234
	A, AE, AC, RN, U	27–53		70+	70+		251
	AC, AE, U	28		1+	1+		103
	AC, AE, DI, I, PR, U, W, WE (with exercise)	20–39		3+			115
	AE, H, PR (with exercise)	23		1+			210
Celeriac (celery root)				31+			250
Raw		27–53		66+			251
Cooked		27–53		25+			251
Celery salt				25+			250
Chamomile (tea)	A, CO, I (skin), V	8		1+		PK 1+; EL 1+	216
Cherry	AE, I (oral)	10–61		13+			177

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Chicken	CU, GI, RC	0.25–19	Double; 2+				26
	AD, CU, GI, RC	0.75–19	Double; 1+	4+			35
	AD, AP, D, N, S, V, W	0.6–19	Double; 1+	1+			36
	A, EX	2.5	Open; 1+		1+		47
	AD, EX	4	Open; 1+				47
					3+		91
	A, DY, U	29		1+	1+	HR 1+	189
	AD, AP, CU, D, N, RN, S, V	1.3–19	Double; 2+	6+			198
	AD, CU, GI, RC, W	0.5–25	Double; 6+				200
	AD		Double; 2+	1+	2+		201
	D	0.11	Open; 1+				235
	DY, H, LE, W	3–27	Double; 2+				199
	AD, AP, AS, N, RN, V	0.33–24	Double; 3+	19+			202
	AE	39		1+	1+		238
Chocolate	CO, FL, HA, NS, U, V	17–58	Double; 5+	3+			56
	AD		Open; 0+	0+			60
	AC, I (throat, nasal), P, S, U, V, W	4–20		18+			69
	AE, BR, D, H, RN, U, V	> 10	Double; 2+	17+			117
	AE, N, S, U, W	4–60	Double; 3+	3+			142
	AP, CU, D, N, RN, S, V, W	1.33–19	Double; 1+	0+			198
	AS, AP, AS, N, RN, V	0.33–24		4+			202
			Double; 4+	0+	0+	HR 1+	256

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Cocoa	CU, GI, RN	0.75–19	Double; 0+	1+			35
	AE, AS, D, DM, RN	1–80	Open; 14+	12+			168
	AD, CU, GI, RC	1.33–19	Double; 10+	13+			198
	DY, H, LE, W	3–27	Double; 42+				199
	AD		Double; 15+	11+	12+		201
	AD, AP, AS, N, RN, V	0.33–24	Double; 44+	55+			202
	AD, AS, RN	3–18	Double; 45+	59+			203
	AD, CU, GI, RC, W	0.5–25	Double; 106+				200
Cinnamate—methyl				6+ (patch)			152
Cinnamate—benzyl				11+ (patch)			152
Cinnamic acetate				3+ (patch)			132
Cinnamic acid				26+ (patch)			152
Cinnamic aldehyde	ST	52		1+ (patch)			54
	EX(hands), CD			3+ (patch)			116
				15+ (patch)			132
				14+ (patch)			152
Cinnamon	CD			117+ (patch)			166
Cinnamon leaf oil				1+ (patch)			132
Cinnamon oil				2+ (patch)			132
	ST	22		1+ (patch)			123
	BU, G, OD			3+ (patch)			151
	EX (hands), CD			2+ (patch)			116

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Cinnamyl alcohol				29+ (patch)			152
Citral	DM	52		1+ (patch)			38
Clams	A, AE, FL, PR, U (with exercise)				1+		143
	AC, CJ, N, U	33	Double; 1+	1+	1+		180
Clove	CD, DM, EX, PM	11–87		36+			166
Clove oil	OI, PU (lips), ST	39		1+ (patch)			209
Coconut				14+			71
Coffee (instant)	FC, OI	47		1+			212
Coriander	A, SW, U, W	14	Double; 1+	1+			24
		48			1+		88
	AD, GP, RN			29+	5+		167
				26+	19+		213
	AS, EX				12+	HR 9+	230
					4+	IB 4+	231
Corn (see maize)							
Cottonseed	AE, BR, D, H, N, U, V	9–79	Double; 2+	6+			15
	A			1+			134
	AE, I, OE, U	29		1+	1+		133
	A	58		1+	1+		176
Cucumber	AE, I (lips, tongue, throat)	12–71				IB 43+	59
	A, GI, LE, OAS	19–53		3+		EL 3+	105
	AE, BR, D, H, RN, U, V	> 10	Double; 0+	32+			117
Pickles	PR	1.5		1+			57
Cumin					1+		88
				24+	11+		213
Curry	CD, DM, EX, PM	11–87	Single; 3+	6+			166
	EX, U				12+	HR 9+	230
					4+	IB 4+	231
Cuttlefish	A, AE, GI, TN, U		Double; 1+	1+	1+		208

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Dill				1+			115
Ethanol	PU	60	Open; 1+	0+			2
	U	28	Open; 1+	0+			112
Fennel	AE, I (oral)	10–61	Open; 4+				177
				28+	24+		213
	A, AE, U (with exercise)	19		1+	0+		192
Flax seed	AE, H, U	43	Open; 1+	1+			214
Garlic	D, FL, N, OA, W	30	Double; 1+	1+	1+	BC 1+	130
Gelatin	AD, U	32		1+	1+	IB 1+	240
Ginger	CD, DM, EX, PM	11–87		7+			166
				3+	13+		213
					1+	IB 1+	231
Grapes	A, CO, FL, NS, PR (with exercise)	15		1+	0+	PH 1+ (after exercise)	51
	A, U, W (with exercise)	24		0+			33
Red	A, EX	4	Open; 1+				47
Grapefruit seeds				2+			188
Guava	I (pharyngeal), RN	33				EL 1+; IB 1+	239
Honey	D, DY, U	35		1+	0+		128
Forest		16–78		10+	7+		89
Rape		16–78		10+	6+		89
Dandelion		16–78		17+	14+		89
Sunflower	AP, D, V	24		1+	1+		29
	A	50		1+	1+		19
Royal jelly	A, BR, D	11					34
Hops	AE, DY, H, LE, U	23	Open; 1+	1+			214
Karaya gum				1 + (erythema only)			252

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Kiwi	A, AE, I (eyes, throat)	26		1+			61
	OAS	32		1+			205
	I (ears), (eyes), RC, U	53		1+		PK 1–	64
	AE, D, PS			10+	10+		74
	OPP			12+	0+		74
	OAS, PR, U, V	26		1+		EL 1+, HR 1–	75
	U			1+	1+		76
	A			3+	3+		104
	B, CL, PR	30	Open; 1+	1+			233
				3+			236
	AD, AE	26		1+	1+		237
	AE, GP, I (tongue), U	20	Open; 1+	1+			258
Lemon	DM	52		1+ (patch)			38
Lettuce	A, AE, U	20		1+			192
	A			2+	2+		90
Eruca sative	I (OM), WH	43		1+	1+		186
Lime	DM	52		1+ (patch)			38
Limpet	A, AE, CH, U	3–27		5+	5+		157
Lentils	DY, V	10		1+			70
	AS	20–22		2+	0+		73
	CO, DY, RN			1+	1+	HR 1+, BC 1+	140
	AS, RN	20				BC 1+	139
		46		1+	1+	HR 1+	182
Lupine				5+	4+		87
	AE, U	5	Open; 1+	1+	1+		87
Mace	EX			12+		HR 8+	230
Maize	CU, GI, RC	0.75–19	Double; 0+	2+			35
	AE				1+		95
						PK 9+	96
	AD, AP, N, RN, V	0.33–24		7+			202
	A	0.71	Open; 1+		0+		47
Maize syrup						PK 3+	96

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Maize dextrimaltose						PK 4+	96
Maize invert sugar	U	30	Open; 1+				171
Maize GF sugar		30	Open; 1+	1+		HR 1+	171
Maize isomerized dextrose	U	30		1+			171
Maize D-psicose	U	30		1+		HR 1+	170
Malt	I (facial), U			1+			227
Maple syrup	ER, PR, U			1+			18
Mango	AC, AE, SW (face), U	28		2+	2+		103
	A, AE, W	24					43
	A, I (eyes), I (mouth), PR, RC	32					195
	A, DY, ER, U	32		1+	0+		149
Melon	AE, D, I (throat), N, U, V	5–75		6+			6
	AE, I (oral)	10–61		3+	0+		177
Watermelon	AD, DY, LE, OAS, U	20–36		3+		EL 3+	105
	OAS	14–67				EL 6+, IB 6+	58
Millet seed	A, AE	25		1+	1+	HR 1+	179
Mushrooms	AE, H, LE, U	31	Open; 1+	1+			214
Ramaria flave	A(1)				1+		118
Shiitake	ER, F	41		0			218
	DM	15–76					163
Mycoprotein ("Quorn")	D, V			2+	2+		221
Mussel		16–42		2+	1+		39

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Mustard		21		1+			21
					10+	HR 4+, EL 4+	80
		39		1+			115
	EX	40		1+			146
	A, AE, RC	17		1+	1+		154
	A, AE, N, RC	14		1+	1+		154
	AD, GP, RN	1–47		29+	5+		167
	SW (glottis), U	Child		1+	1+		178
	AE, H, LE	43	Open; 1+	1+			214
	A, AE, U	25			1+		248
Black		Child			1+		178
White		Child			1+		178
Seed	A, AE, U				7+	HR 2+	52
	AE, AS, DY, I (nasal), S, U	31		1+	1+	HR 1+	135
	AE, AS, I (scalp, genitals), U, V	32		1+	1+		135
Nutmeg				3+	1+, 14+ flower		213
Oats				3+	2+		53
	AE, U				0+		95
	AD, AP, AS, N, RN, V	0.33–24		7+			202
	AS, GI, U				9+		217
Orange	DM	52		1+ (patch)			38
	AE, BR, D, H, RN, U, V	> 10	Double; 6+	21+			117
	AE, I (oral)	10–61		11+	3+		177
	A, AE, DY, I, U	49					249
	A, AE, AS, GI, LE, N, RC, U, V	25–61	Open; 0+ (juice)	0+ (juice)		PK 1+ (seed)	257
			Open; 3+ (seed)	3+ (seed)			257
				2+ (seed)			188
Mandarin	I (pharyngeal), RN	33				EL 1+, 1B 1+	239
Orange juice	AC, AE, DY, N, U	33		0+			78
						PK 20+	188

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Oysters	AE, FL, PR, U (with exercise)				1+		143
		16–42		2+			39
Papain	AE, E, DY, I, W	31	Single; 1+	1+		PK 1+	137
	AP, CJ, D, U		Double; 5+	5+	5+		138
Chymo-papain					6+		197
Paprika	CD, DM, EX, PM	11–87		4+			166
	AD, GP, RN			22+	6+		167
Parsley	I (nasal, eye), LE, TS, W	48		1+			88
	A, AE, U	18–55		12+			114
Pea	AD, AS, RN		Double; 2+	18+			17
		0.25–19	Double; 5+				26
	DY, V	10		1+			70
	AS	20–22		2+	2+		73
		20		1+	1+	HR 1+	139
	AE, AS, D, DM, RN	1–80		42+			168
	AE, I (oral)	10–61		5+	4+		177
	AC, AD, AS, N, RN, V	0.33–24		19+			202
Chickling		39		1+			98
Peach	AE, AS, GI, RN, U			69+		HR 58+	3
	DY, N	30			1+		42
	AC, U	28		1+	1+		103
	AE, BR, D, H, RN, U, V	> 10	Open; 6+, Double; 43+	65+			117
	CU, OAS	16–27		25+ (flesh)			127
				22+ (skin)			127
	AE, U	14	Double; 0+	1+	0+		128
				8+	8+	1B 3+	220
	A, I (pharyn-geal), RN	33				EL 1+	239
	A, AE, D, GI, U (with exercise)	24		1+			33

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Peanut oil	AD, AE (with peanuts)	0.5	Open; 1+				153
	AE, AS, D, H, LE, N, V (with peanuts)	17–45	Double; 0+	0+			219
	AD, AE, ER (with peanut oil)	0.5	Open; 1+	1+	1+		153
	AD (with peanut oil)	0.33	Open; 1+	1+	1+		153
	EX (with peanut oil)	"infant"	Open; 1+	1+			85
Pear	AE, I (oral)	10–61		6+			177
	I (hands), OI, SW (hands)	24		1+ raw; 0+ cooked			228
Pepper		48		1+			88
Cayenne	AD, GP, RN	1–47		20+	7+		167
Red				11+	16+		213
White	CD, OM, EX, PM	11–87		4+			166
	EX				12+	HR 2+	230
	AD, GP, RN	1–47		4+	3+		167
				5+	15+		213
Pineapple	A, D, I, V	5–70					107
Plum	A, EX	4	Open; 1+				47
Pomegranate	AE, TS	85	Double; 1+	0	0	HR 1–	97
Poppy seed	AE, RC, U, V	20		1+	1+		31
	AE, AS	27		1+	1+		110
	A, AD, AE, AS, D, P, U, V	11–33		5+	5+		237
Pork	AD, CU, GI, RC	0.75–19	Double; 0+	3+			35
	AD, DY, H, LE, W	3–27	Double; 1+				199
	AD, AP, CU, D, N, RN, S, V	1.33–19	Double; 0+	7+			198
	AD, CU, GI, RC		Double; 3+				200
	AD, AP, AS, N, RN, V	0.33–24	Double; 2+	32+			202

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Potato	AE, RN			24+			5
	A, AE, AS, H, S, U, V	11		1+	1+	HR 1+; PK 1+; IB 1+	40
		4–18		139+			55
	AE, DY, W	17		1+		HR 1+	78
	AE			2+			83
	RN, S, TP	24		1+		PK 1+	164
	AE, OAS	10–61		7+	3+		177
	AE, AS, U	21		1+		PK 1+	185
	CU, GI , LE, NS	0.5–25	Double; 4+				200
	AP, D, N, NS, RN, S, V, W	1.33–19	Double; 1+	2+			198
	DY, H, LE, W	3–27	Double; 1+				199
	AD, AP, AS, N, RN, V	0.33–24	Double; 2+	7+			202
	GI, U	1–16			12+	IB 5+; HR 8+	241
	EX	0.71	Open; 1+				47
Psyllium	A, I (eyes), V	43		1+			10
	A, AC, CO, D, H, I (eyes), N, V, W	27–73			18+	IB 20+	102
	A, AE, CO, I (mouth), V	43		1+			111
	A, AE, TC, U	60			1+	HR 1+	122
	AS, RN	28		1+			194
Rape		40		1+			146
Rice	A, D, V	0.75	Single; 1+				28
	A, AC, AE, DY, PR	21		1+		HR 1+	78
	GI, NS	55	Open; 1+	1+ raw, 1+ cooked	1+ raw, 0+ cooked	HR 1+, IB 1+	160
	AD, AP, AS, N, RN, V	0.33–24		8+			202
	AS, EX	5–21		6+	6+		207
	D, FL, V	2			1+	IB 1+, PK 1+	215
	AD, AS					HR 17+, IB 32+	223
	QE	25		1+			226
	D, V	0.5	Open; 1+				235
					4+		242
	DM				10+		243

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Rye	CU, GI, RC	0.25–19	Double; 1+				26
				3+	3+		53
	AD, AP, CU, D, N, RN, S, V, W	1.25–19	Double; 1+	2+			198
	AD, AP, AS, N, RN, V	0.33–24		8+			202
	AS, GI, U				10+		217
	AS, DM, RN	12–46		2+	8+		237
	AE, PR, VC (with exercise)	16		1+	0+		12
Sesame seed	A, AE, B, FL, I (general), RD, TN, U, W	30			1+		99
	A, AE, D, E, N, U, V	20–38		5+	5+		108
	A, AE, H, PP, U	31–72			3+		136
	AE	45		1+	1+		237
	AS	6–17					244
Single cell protein	D, N,V		Open; 7+		0+		206
	D, N, V		Open; 2+		0+		206
Soybean oil	AE, AP, LE, RC, RN, U, W (with soybeans)	18–63	Double; 0+	0+			37
Spinach		20		1+	1+	HR 1–	49
Squash	CU, GI, RC	0.25–19	Double; 1+				26
Squid—Raw		16–42		0+	1+	BC 1+	39
Boiled	AE, AS, CJ, D, N, U, V	16–42	Double; 0+	7+	7+		39
Strawberry	AC, AD, AS, N, RN, V	0.33–2		1+			202
	I (pharyngeal), RN	33				EL 1+	239
Sugar beet		20		1+	1+	HR 1–	49

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Sunflower seed	AE, BR, D, H, RN, U, V	> 10	Double; 25+	52+			117
	A, AE, DY, N, PR, U, V, W	29–37	Open; 0+ (oil)	2+	2+	PK 1+ (seed)	82
	A, AE, GP, I (lips)	11–58		3+	3+		174
	AE, H, LE	34	Open; 1+	1+			214
		13	Open; 0+ (w/exercise)	1+			141
Sunflower oil	A, AE, DY, N, PR, U, V, W (with sunflower seeds)	29–37	Open; 0+ (oil)	2+	2+	PK 1+ (seed)	82
Swiss chard	AS, RCJ	20	Open; 1+	1+	1+	HR 1+	49
	I (eyes, nasal), RN, S	46		1+	1+	BC 1+; HR 1+	182
Tangerine	AC, AE, DY, N, U	33		1+			78
Tangerine seeds				2+			188
Tomato	AE, AS, DM, U	12–45		9+			22
	DM, I (lips)			7+			83
	AE, BR, D, H, RN, U, V	> 10	Double; 2+	18+			117
	EX, U			1+			144
	AE, I (oral)	10–61		12+	5+		177
	AD, AP, AS, N, RN, V	0.33–24		5+			202
	DM, I (throat, lips)			4+	9+		50
	A (with exercise)	20–39		2+			115
Tragacanth gum	AS, U	33	Open; 1+	1+		PK 1+	32
	AE, AP, DY, PR	35		1+			44
	I			1+			196
		39		1 + (erythema only)			252
Turkey	CU, GI, RC	0.25–19	Double; 1+				26
Turnip				1+			178
Vanillin				3+			166
				8+ (patch)			152

Table 2. *Continued*

Food	Symptoms (see end of table for list)	Age Years	Oral Challenge	Skin Test	RAST	Other Assays	Ref.
Vitamin A	AD, V	0.75	Double; 1+	0+			81
Vitamin E	DM	21		1+ (patch)			191
Wine	PU	60	Open; 1+				2
	A, AE, U	31		1+	0+	PK 1–	41
Yeast	U		Double; 5+				100
	AE, U	34	Open; 1+ (wine)	1+			112
	U	33	Open; 1+ (wine)	1+			112
	AS, EX, RN	6–51		39+			119
	AE, NS, PR, U	15–66		7+			131
	AS	15		1+			225
Saccharomyces cerevisae	AD, EX			28+			109
Zucchini		12–71				EL 62+	59

[a]This table was compiled using literature searches of the Agricola (1972 to July 1994) and Medline (1966 to July 1994) databases.

Abbreviations: A, anaphylaxis; AC, abdominal cramping; AD, atopic dermatitis; AE, angioedema; AP, abdominal pain; AS, asthma; B, burning mouth or lips; BC, bronchial challenge; BR, bronchospasm; BU, buccal ulceration; C, chills; CD, contact dermatitis; CH, choking; CJ, conjunctivitis; CL, Colic; CMA, cows' milk allergy; CO, cough; CU, cutaneous complaint (see banana); CY, cyanosis; D, diarrhea; DI, dizziness; DM, dermatitis; DS, difficult swallowing; DY, dyspnea; E, edema; EL, enzyme linked immunosorbent assay; ER, erythema; EX, eczema; F, fever; FC, flatulence; FL, flushing; G, gingivostomatitis; GI, gastrointestinal symptoms; GP, gastric pain; H, hypotension; HA, headache; HR, histamine release assay; I, itching; IB, immunoblotting; LE, laryngeal edema; LV, lost voice; M, migraine; N, nausea; NS, nasal symptoms; OA, occupational asthma; OAS, oral allergy syndrome; OD, oral dermatitis; OE, oral edema; OI, oral irritation; OM, oral mucosa; OPP, oropharyngeal pruritus; P, palpebrae (eyelids); PH, plasma histamine; PK, Prausnitz-Kustner test; PM, pompholyx; PP, pharyngeal pruritus; PR, pruritus; PS, pharyngeal swelling; PU, purpura; QE, Quincke's edema (see rice); RAST, radioallergosorbant test; RC, respiratory complaints; RCJ, rhinoconjunctivitis; RD, respiratory distress; RN, rhinitis; S, sneezing; ST, stomatitis; SW, swelling; T, elevated tryptase; TC, tachycardia; TN, tongue swelling; TP, throat pain; TS, throat swelling; TT, throat tightness; U, urticaria; UC, chronic urticaria; V, vomiting; VC, vascular collapse; W, wheezing; WE, weakness; WH, wheal

References for Tables 1 and 2

1. Aas, K., Studies of hypersensitivity to fish; a clinical study, *Int. Arch. Allergy*, 29, 346, 1966.
2. Alibrandi, B., Parodi, A., and Varaldo, G., Purpura due to ethanol, *N. Engl. J. Med.*, 322, 702, 1990.
3. Amat, P., Valero, A., Sanosa, J., Malet, P.A., and Garcia-Calderon, A., Hypersensitivity to dried fruits, *N. Engl. Req. Allergy Proc.*, 9(Abstr.), 408, 1988.
4. Anderson, J. A., Evaluation of patients with unusual reactions to foods and medication, *American Academy of Allergy and Immunology Workshop Manual*, 1994, 1. Anaheim, CA, March 4–9, 1994.

5. Anderson, K. E., and Lowenstein, H., An investigation of the possible immunological relationship between allergen extracts from birch pollen, hazelnut, potato, and apple, *Contact Dermatitis*, 4, 73, 1978.
6. Anderson, L. B., Dreyfuss, E. M., Logan, J., Johnston, D. E., and Glaser, J., Melon and banana sensitivity coincident with ragweed pollinosis, *J. Allergy*, 45, 310, 1970.
7. Anibarro, B., Garcia-Ara, M. C., and Pascual, C., Associated sensitization to latex and chestnut, *Allergy*, 48, 130, 1993.
8. Anibarro, B., Garcia-Ara, M. C., Pascual-Marcos, C., and Martin-Esteban, M., Crossed allergenicity between latex and chestnut, *Schweiz. Med. Wochenschr.*, 121(Abstr., Suppl. 40), 81, 1991.
9. Anibarro, B., Dominguez, C., Diaz, J.M., Martin, M. F., Garcia-Ara, M. C., Bayano, M. T., and Ojeda, J. A., Apple-dependent exercise-induced anaphylaxis, *Allergy*, 49, 481, 1994.
10. Anon. Kellogg adds allergy warning to Heartwise cereal labels, *Food Chem. News*, October 15, 1990, 59.
11. Aoki, T., and Kushimoto, H., Type I wheat ingestion allergy: a model of masked allergy, *N. Engl. Reg. Allergy Proc.*, 8, 34, 1987.
12. Armentia, A., Martin-Santos, J. M., Blanco, M., Carretero, L., Puyo, M., and Barber, D., Exercise-induced anaphylactic reaction to grain flours, *Ann. Allergy*, 65, 149, 1990.
13. Armentia, A., Quintero, A., Fernandez-Garcia, A., Salvador, J., and Martin-Santos, J. M., Allergy to pine pollen and pinon nuts: a review of 3 cases, *Ann. Allergy*, 64, 49, 1990.
14. Arshad, S. H., Malmberg, E., Krapf, K., and Hide, D. W., Clinical and immunological characteristics of brazil nut allergy, *Clin. Exp. Allergy*, 21, 373, 1991.
15. Atkins, F. M., Wilson, M., and Bock, S. A., Cottonseed hypersensitivity: new concerns over an old problem, *J. Allergy Clin. Immunol.*, 82, 242, 1988.
16. Bargman, T. J., Rupnow, J. H., and Taylor, S. L., IgE-binding proteins in almonds (*Prunus amygdalus*); identification by immunoblotting with sera from almond-allergic adults, *J. Food Sci.*, 57, 717, 1992.
17. Bernhisel-Broadbent, J., and Sampson, H. A., Cross-allergenicity in the legume botanical family in children with food hypersensitivy, *J. Allergy Clin. Immunol.*, 83, 435, 1989.
18. Binkley, K. E., Making maple syrup: hazardous avocational ingestion of raw sap in a patient with nut and tree pollen sensitivity, *J. Allergy Clin. Immunol.*, 94, 267, 1994.
19. Birnbaum, J., Tafforeau, M., Vervloet, D., Charpin, J., and Charpin, D., Allergy to sunflower honey associated with allergy to celery, *Clin. Exp. Allergy*, 19, 229, 1989.
20. Bjorksten, F., Halmepuro, L., Hannuksela, M., and Lahti, A., Extraction and properties of apple allergens, *Allergy*, 35, 671, 1980.
21. Blaiss, M. S., McCants, M. L., and Lehrer, S. B., Anaphylaxis to cabbage: detection of allergens, *Ann. Allergy*, 58, 248, 1987.
22. Bleumink, E., Berrens, L., and Young, E., Studies on the atopic allergen in ripe tomato fruits. I. Isolation and identification of the allergen, *Int. Arch. Allergy*, 30, 132 , 1966.
23. Bock, S. A., Natural history of severe reactions to foods in young children, *J. Pediatr.*, 107, 676, 1985.
24. Bock, S. A., Anaphylaxis to coriander: a sleuthing story, *J. Allergy Clin. Immunol.*, 91, 1232, 1993.
25. Bock, S. A., and Atkins, F. M., The natural history of peanut allergy, *J. Allergy Clin. Immunol.*, 83, 900, 1989.
26. Bock, S. A., and Atkins, F. M., Patterns of food hypersensitivity during sixteen years of double-blind, placebo-controlled food challenges, *J. Pediatr.*, 117, 561, 1990.

27. Bock, S. A., Lee, W. Y., Remigio, L. K., and May, C. D., Studies of hypersensitivity reactions to foods in infants and children, *J. Allergy Clin. Immunol.*, 62, 327, 1978.
28. Borchers, S. D., Li, B. U., Friedman, R. A., and McClung, H. J., Rice-induced anaphylactoid reaction, *J. Pediatr. Gastroenterol. Nutr.*, 15, 321, 1992.
29. Bousquet, J., Dhivert, H., Clauzel, A. M., Hewitt, B., and Michel, F. B., Occupational allergy to sunflower pollen, *J. Allergy Clin. Immunol.*, 75, 70, 1985.
30. Boyd, G. K., Fatal nut anaphylaxis in a 16-year-old male: case report, *Allergy Proc.*, 10, 255, 1989.
31. Braun, W., and Kovary, P. M., Poppy seed allergy, *Z. Hautkrankheiten* (transl.), 63, 344, 1988.
32. Brown, E. B., and Crepea, S. B., Allergy (asthma) to ingested gum tragacanth: a case report, *J. Allergy*, 18, 214, 1947.
33. Buchbinder, E. M., Bloch, K. J., Moss, J., and Guiney, T. E., Food-dependent exercise-induced anaphylaxis, *J. Am. Med. Assoc.*, 250, 2973, 1983.
34. Bullock, R. J., Rohan, A., and Straatmans, J. A., Fatal royal jelly–induced asthma, *Med. J. Aust.*, 160, 44, 1994.
35. Burks, A. W., Mallory, S. B., Williams, L. W., and Shirrell, M. A., Atopic dermatitis: clinical relevance of food hypersensitivity reactions, *J. Pediatr.*, 113, 447, 1988.
36. Burks, A. W., Williams, L. W., Mallory, S. B., Shirrell, M. A., and Williams, C., Peanut protein as a major cause of adverse food reactions in patients with atopic dermatitis. *Allergy Proc.*, 10, 265, 1989.
37. Bush, R. K., Taylor, S. L., Nordlee, J. A., and Busse, W. W., Soybean oil is not allergenic to soybean-sensitive individuals, *J. Allergy Clin. Immunol.*, 76, 242, 1985.
38. Cardullo, A. C., Ruszkowski, A. M., and DeLeo, V. A., Allergic contact dermatitis resulting from sensitivity to citrus peel, geraniol, and citral, *J. Am. Acad. Dermatol.*, 21, 395, 1989.
39. Carrillo, T., Castillo, R., Caminero, J., Cuevas, M., Rodriguez, J. C., Acosta, O., and Rodriguez de Castro, F., Squid hypersensitivity: a clinical and immunologic study, *Ann. Allergy*, 68, 483, 1992.
40. Castells, M. C., Pascual, C., Esteban, M. M., and Ojeda, J. A., Allergy to white potato, *J. Allergy Clin. Immunol.*, 78, 1110, 1986.
41. Clayton, D. E., and Busse, W., Anaphylaxis to wine, *Clin. Allergy*, 10, 341, 1980.
42. Crisi, G., and Belsito, D. V., Contact urticaria from latex in a patient with immediate hypersensitivity to banana, avocado, and peach, *Contact Dermatitis*, 28, 247, 1993.
43. Dang, R. W. M., and Bell, D. B., Anaphylactic reaction to the ingestion of mango: case report, *Hawaii Med. J.*, 27, 149, 1967.
44. Danoff, D., Lincoln, L., Thomson, D. M. P., and Gold, P., "Big Mac attack," *N. Engl. J. Med.*, 298, 1095, 1978.
45. Daul, C. B., Morgan, J. E., and Lehrer, S. B., The natural history of shrimp hypersensitivity, *J. Allergy Clin. Immunol.*, 86, 88, 1990.
46. Daul, C. B., Morgan, J. E., Hughes, J., and Lehrer, S. B., Provocation-challenge studies in shrimp-sensitive individuals, *J. Allergy Clin. Immunol.*, 81, 1180, 1988.
47. David, T. J., Anaphylactic shock during elimination diets for severe atopic eczema, *Arch. Dis. Child.*, 59, 983, 1984.
48. Davidson, A. E., Passero, M. A., and Settipane, G. A., Buckwheat-induced anaphylaxis: a case report, *Ann. Allergy*, 69, 439, 1992.
49. de la Hoz, B., Fernandez-Rivas, M., Quirce, S., Cuevas, M., Fraj, J., Davila, I., Igea, J. M., and Losada, E., Swiss chard hypersensitivity: clinical and immunologic study, *Ann. Allergy*, 67, 487, 1991.

50. de Martino, M., Novembre, E., Cozza, G., de Marco, A., Bonazza, P., and Vierucci, A., Sensitivity to tomato and peanut allergens in children monosensitized to grass pollen, *Allergy*, 43, 206, 1988.
51. Dohi, M., Suko, M., Sugiyama, H., Yamashita, N., Tadokoro, K., Juji, F., Okudaira, H., Sano, Y., Ito, K., and Miyamoto, T., Food-dependent exercise-induced anaphylaxis: a study on 11 Japanese cases, *J. Allergy Clin. lmmunol.*, 87, 34, 1991.
52. Dominguez, J., Cuevas, M., Urena, V., Munoz, T., and Moneo, I., Purification and characterization of an allergen of mustard seed, *Ann. Allergy*, 64, 352, 1990.
53. Donovan, G. R., and Baldo, B. A., Immunoaffinity analysis of cross-reactive allergens by protein blotting, *Electrophoresis*, 14, 917, 1993.
54. Drake, T. E., and Maisbach, H. I., Allergic contact dermatitis and stomatitis caused by cinnamic aldehyde-flavored toothpaste. *Arch Dermatol.*, 112, 202, 1976.
55. Dreborg, S., and Foucard, T., Allergy to apple, carrot, and potato in children with birch pollen allergy, *Allergy*, 38, 167, 1983.
56. Drelich, J. M., Anderson, J. A., and Sears-Ewald, D. A., Chocolate allergy evaluated by double-blind, placebo-controlled food challenge. *J. Allergy Clin. Immunol.*, 91(Abstr.), 342, 1993.
57. Edwards, E. K., Jr., and Edwards, E. K., Contact urticaria provoked by pickles, *Cutis*, 33, 230, 1984.
58. Enberg, R. N., McCullough, J., and Ownby, D. R., Antibody responses in watermelon sensitivity, *J. Allergy Clin. Immunol.*, 82, 795, 1988.
59. Enberg, R. N., Leickly, F. E., McCullough, J., Bailey, J., and Ownby, D.R., Ragweed and watermelon share allergens, *J. Allergy Clin. Immunol.*, 79, 867, 1987.
60. Falconieri, P., Luacenti, P., Ziruolo, G., and Businco, L., Chocolate hypersensitivity is not common in children with atopic dermatitis, *J. Allergy Clin. Immunol.*, 91(Abstr.), 342, 1993.
61. Falliers, C. J., Anaphylaxis to kiwi fruit and related "exotic" items, *J. Asthma*, 20, 193, 1983.
62. Falliers, C. J., Pine nut allergy in perspective, *Ann. Allergy*, 62, 186, 1989.
63. Fernandez de Corres, L., Moneo, I., Munoz, D., Bernaola, G., Fernandez, E., Audicana, M., and Urrutia, I., Sensitization from chestnuts and bananas in patients with urticaria and anaphylaxis from contact with latex, *Ann. Allergy*, 70, 35, 1993.
64. Fine, A. J., Hypersensitivity reactions to kiwi fruit (Chinese gooseberry, *Actinidia chinensis*), *J. Allergy Clin. Immunol.*, 68, 235, 1981.
65. Fine, A. J., Hypersensitivity reaction to pine nuts (Pinon nuts—Pignolia) *Ann. Allergy*, 59, 183, 1987.
66. Fisher, A. A., Association of latex and food allergy, *Cutis*, 52, 70, 1993.
67. Ford, R. P. K., and Fergusson, D. M., Egg and cows' milk allergy in children, *Arch. Dis. Child.*, 55, 608, 1980.
68. Forsbeck, M., and Ros, A. M., Anaphylactoid reaction to celery, *Contact Dermatitis*, 5, 191, 1979.
69. Fries, J. H., The cocoa bean and the allergic child, *Ann. Allergy*, 24, 484, 1966.
70. Fries, J. H., Peanuts: allergic and other untoward reactions, *Ann. Allergy*, 48, 220, 1982.
71. Fries, J. H., and Fries, M. W., Coconut: a review of its uses as they relate to the allergic individual, *Ann. Allergy*, 51, 472, 1983.
72. Frosch, P. J., Kalveram, K. J., and Forck, G., Anaphylaktische Reaktion auf Bananen, *Allergologie*, 10, 152, 1987.
73. Gall, H., Forck, G., Kalveram, K.-J., and van Lersner-Lenders, S., Immediate-type allergy to legume foods (in German), *Allergologie*, 13, 352, 1990.

74. Gall, H., Kalevam, K. J., Forck, G., and Sterry, W., Kiwi fruit allergy: a new birch pollen-associated food allergy, *J. Allergy Clin. Immunol.*, 94, 70, 1994.
75. Garcia, B. E., de la Cuesta, C. G., Santos, F., Feliu, X., and Cordoba, H., A rare case of food allergy: monosensitivity to kiwi (*Actinidia chinensis*), *Allergol. Immunopathol.*, 17, 217, 1989.
76. Garmendia, J., and Joral, A., Immediate hypersensitivity to papain and kiwi, *Allergy*, 47(Suppl.). 300, 1992.
77. Gillespie, D. N., Nakajima, S., and Gleich, G. J., Detection of allergy to nuts by the radioallergosorbent test, *J. Allergy Clin. Immunol.*, 57, 302, 1976.
78. Golbert, T. M., Patterson, R., and Pruzansky, J. J., Systemic allergic reactions to ingested antigens, *J. Allergy*, 44, 96, 1969.
79. Goldman, A. S., Anderson, D. W., Jr., Sellers, W. A., Saperstein, S., Kniker, W. T., and Halpern, S. R., Milk allergy. I. Oral challenge with milk and isolated milk proteins in allergic children, *Pediatr.*, 32, 425, 1963.
80. Gonzalez de la Pena, M. A., Menendez-Arias, L., Monsalve, R. I., and Rodriguez, R., Isolation and characterization of a major allergen from oriental mustard seeds, BrajI, *Int. Arch. Appl. Immunol.*, 96, 263, 199l.
81. Greenbaum, J., Vitamin A sensitivity, *Ann. Allergy*, 43, 98, 1979.
82. Halsey, A. B., Martin, M. E., Ruff, M. E., Jacobs, F. O., and Jacobs, R. L., Sunflower oil is not allergenic to sunflower seed–sensitive patients, *J. Allergy Clin. Immunol.*, 78, 408, 1986.
83. Hannuksela, M., and Lahti, A., Immediate reactions to fruits and vegetables, *Contact Dermatitis*, 3, 79, 1977.
84. Hansen, T. K., and Bindslev-Jensen, C., Codfish allergy in adults: identification and diagnosis, *Allergy*, 47, 610, 1992.
85. Hatahet, R., Kanny, G., and Moneret-Vautrin, D. A., Allergy to peanut in the infant: the danger of certain formulas (in French), *Rev. Fr. Allergol.*, 32, 86, 1992.
86. Haydel, R., El-Dahr, J., McCants, M., Helbling, A., Musmand, J., and Lehrer, S., Food allergy: challenge studies of fish allergic subjects, *J. Allergy Clin. Immunol.*, 9l(Abstr.), 344, 1993.
87. Hefle, S. L., Lemanske, R. F., and Bush, R. K., Adverse reaction to lupine-fortified pasta, *J. Allergy Clin. Immunol.*, 94, 167, 1994.
88. Helbling, A., Lopez, M., Schwartz, H. J., and Lehrer, S. B., Reactivity of carrot-specific IgE antibodies with celery, apiaceous spices, and birch pollen, *Ann. Allergy*, 70, 495, 1993.
89. Helbling, A., Peter, C., Berchtold, E., Bogdanov, S., and Muller, U., Allergy to honey: relation to pollen and honeybee allergy, *Allergy*, 47, 41, 1992.
90. Helbling, A., Schwartz, H. J., Lopez, M., and Lehrer, S. B., Lettuce and carrot allergy: are they related?, *J. Allergy Clin. Immunol.*, 89(Abstr.), 198, 1992.
91. Hermann, K., Laabs, R., Gross, C., and Matsson, P., Characterization of chicken meat, egg white and egg yolk by SDS-PAGE, immunoblotting and RAST inhibition, *J. Allergy Clin. Jmmunol.*, 93(Abstr.), 211, l994.
92. Heyer, N., Mold enzymes as a cause of food allergies, case histories (in Gennan), *Allergologie*, 10, 78, 1987.
93. Hide, D. W., Clinical curio: allergy to brazil nut, *Br. Med. J. Clin. Res.*, 287, 900, 1983.
94. Hirschwehr, R., Valenta, R., Ebner, C., Ferreira, F., Sperr, W. R., Valent, P., Rohac, M., Rumpold, H., Scheiner, O., and Kraft, D., Identification of common allergenic structures in hazel pollen and hazelnuts: a possible explanation for sensitivity to hazelnuts in patients allergic to tree pollen, *J. Allergy Clin. Immunol.*, 90, 927, 1992.

95. Hoffman, D. R., The specificities of human IgE antibodies combining with cereal grains, *Immunochemistry*, 12, 535, 1975.
96. Howard, W. A., Todd, R. H., and Dalton, G. L., Studies on the allergenicity of corn products, *J. Allergy*, 30, 381, 1959.
97. Igea, J. M., Cuesta, J., Cuevas, M., Elias, L. M., Marcos, C., Lazaro, M., and Compaired, J. A., Adverse reaction to pomegranate ingestion, *Allergy*, 46, 472, 1991.
98. Igea, J. M., Fernandez, M., Quirce, S., de la Hoz, B., and Luz Diez Gomez, M., Green bean hypersensitivity: an occupational allergy in a homemaker, *J. Allergy Clin. Immunol.*, 94, 33, 1994.
99. James, C., Williams-Akita, A., Rao, Y. A. K., Chiarmonte, L. T., and Scheider, A. T., Sesame seed anaphylaxis, *N.Y. State J. Med.*, 91, 457, 1991.
100. James, J., and Warin, R. P., An assessment of the role of *Candida albicans* and food yeasts in chronic urticaria , *Br. J. Dermatol.*, 84, 227, 1971.
101. James, J. M., Bernhisel-Broadbent, J., and Sampson, H. A., Respiratory reactions provoked by double-blind food challenges in children, *Am. J. Respir. Crit. Care Med.*, 149, 59, 1994.
102. James, J. M., Cooke, S. K., Barnett, A., and Sampson, H. A., Anaphylactic reaction to psyllium-containing cereal, *J. Allergy Clin. Immunol.*, 88, 403, 1991.
103. Jansen, A., de Lijster de Raadt, J., van Toorenenbergen, A. W., and van Wijk, R. G., Allergy to pistachio nuts, *Allergy Proc.*, 13, 255, 1992.
104. Joral, A., and Garmendia, J., Food allergy due to sensitivity to kiwi, *Allergy*, 47(Abstr., Suppl.), 211, 1992.
105. Jordan-Wagner, D. L., Whisman, B. A., and Goetz, D. W., Cross-allergenicity among celery, cucumber, and watermelon. *Ann. Allergy*, 71, 70, 1993.
106. Juhlin, L., Recurrent urticaria: clinical investigation of 330 patients, *Br. J. Dermatol.*, 104, 369, 1981.
107. Kabir, I., Speelman, P., and Islam, A., Systemic allergic reaction and diarrhea after pineapple ingestion, *Trop. Geogr. Med.*, 45, 77, 1993.
108. Kagi, M. K., and Wuthrich, B., Falafel burger anaphylaxis due to sesame seed allergy, *Ann. Allergy*, 71, 127, 1993.
109. Kalimo, K., Lammintausta, K., Varjonen, E., and Saolainen, J., Yeast allergy in adult atopic dermatitis: clinical picture, skin test reacitivty and results of antifungal treatment, in *Immunological and Pharmacological Aspects of Atopic and Contact Eczema*, Czernielewski, J. M., Ed., Karger, Basel, 1991, 164.
110. Kalyoncu, A. F., and Stalenheim, G., Allergy to poppy seed, *Allergy*, 48, 295, 1993.
111. Kaplan, M. J., Anaphylactic reaction to "Heartwise," *N. Engl. J. Med.*, 323, 1072, 1990.
112. Karvonen, J., and Hannuksela, M., Urticaria from alcoholic beverages, *Acta. Allergol.*, 31, 167, 1976.
113. Kasperick, G., and Ownby, D., Isolation of a major allergen from dried beans (*Phaseolus vulgaris*), *J. Allergy Clin. Immunol.*, 73(Abstr.), 176, 1984.
114. Kauppinen, K., Kousa, M., and Reunala, T., Aromatic plants—a cause of severe attacks of angioedema and urticaria, *Contact Dermatitis*, 6, 251, 1980.
115. Kidd, J. M., Cohen, S. H., Sosman, A. J., and Fink, J. N., Food-dependent exercise-induced anaphylaxis, *J. Allergy Clin. Immunol.*, 71, 407, 1983.
116. Kirton, V., and Wilkinson, D.S., Sensitivity to cinnamic aldehyde in a toothpaste. 2. Further studies, *Contact Dermatitis*, 1, 77, 1975.

117. Kivity, S., Dunner, K., and Marian, Y., The pattern of food hypersensitivity in patients with onset after 10 years of age, *Clin. Exp. Allergy*, 24, 19, 1994.
118. Koivikko, A., and Savolainen, J., Mushroom allergy, *Allergy*, 43, 1, 1988.
119. Koivikko, A., Kalimo, K., Nieminen, E., Savolainen, J., Viljanen, M., and Viander, M., Allergenic cross-reactivity of yeasts, *Allergy*, 43, 192, 1988.
120. Kushimoto, H., and Aoki, T., Masked type I wheat allergy, *Arch. Dermatol.*, 121, 355, 1985.
121. Lahti, A., and Hannuksela, M., Hypersensitivity to apple and carrot can be reliably detected with fresh material, *Allergy*, 33, 143, 1978.
122. Lantner, R. R., Espirito, B. R., Zumerichik, P., and Tobin, M. C., Anaphylaxis following ingestion of a psyllium-containing cereal, *J. Am. Med. Assoc.*, 264, 2535, 1990.
123. Laubach, J. L., Malkinson, F. D., and Ringrose, E. J., Cheilitis caused by cinnamon (cassia) oil in toothpaste, *J. Am. Med. Assoc.*, 152, 404, 1953.
124. Laurent, J., Jahn, H., and Lagrue, G., The role of cross-reacting inhalent and food allergen in the relapse of lipoid nephrosis (letter in French)., *Presse Med.*, 14, 1932, 1985.
125. Lavaud, F., Cossart, C., Reiter, V., Bernard, J., Deltour, G., and Holmquist, I., Latex allergy in patients with allergy to fruit, *Lancet*, 339, 492, 1992.
126. Linaweaver, W. E., Saks, G. L., and Heiner, D. C., Anaphylactic shock following banana ingestion, *Am. J. Dis. Child.*, 130, 207, 1976.
127. Lleonart, R., Cistero, A., Carreira, J., Batista, A., and Moscoso del Prado, J., Food allergy: identification of the major IgE-binding component of peach (*Prunus persica*), *Ann. Allergy*, 69, 128, 1992.
128. Lombardi, P., Campolmi, P., Giorgini, S., Spallanzani, P., and Sertoli, A., Contact urticaria from fish , honey, and peach skin. *Contact Dermatitis*, 9, 422, 1983.
129. Lopez, M., Schwartz, H., Helbling, A., and Lehrer, S., Anaphylaxis to carrot: cross reactivity of carrot specific IgE with spices from the umbelliferae family (UF), *J. Allergy Clin. Immunol.*, 87 (Abstr.), 274, 1991.
130. Lybarger, J. A., Gallagher, J. S., Pulver, D. W., Litwin, A., Brooks, S., and Bernstein, I. L., Occupational asthma induced by inhalation and ingestion of garlic, *J. Allergy Clin. Immunol.*, 69, 448, 1982.
131. MacKechnie, H. L. N., The clinical spectrum of yeast hypersensitivity, *Ann. Allergy*, 39, 334, 1977.
132. Magnusson, B., and Wilkinson, D., Cinnamic aldehyde in toothpaste. 1. Clinical aspects and patch tests, *Contact Dermatitis*, 1, 70, 1975.
133. Malanin, G., and Kalimo, K., Angioedema and urticaria caused by cottonseed protein in wholegrain bread, *J. Allergy Clin. Immunol.*, 82, 261, 1988.
134. Malanin, G., and Kalimo, K., Was the candy really responsible for the anaphylaxis in a cottonseed-sensitive patient?, *J. Allergy Clin. Immunol.*, 86, 277, 1990.
135. Malet, A., Valero, A., Lluch, M., Bescos, M., Amat, P., and Serra, E., Hypersensitivity to mustard seed, *Allergy*, 48, 62, 1993.
136. Malish, D., Glovsky, M. M., Hoffman, D. R., Ghekiere, L., and Hawkins, J. M., Anaphylaxis after sesame seed ingestion, *J. Allergy Clin. Immunol.*, 67, 3, 1981.
137. Mansfield, L. E., and Bowers, C. H., Systemic reaction to papain in a nonoccupational setting, *J. Allergy Clin. Immunol.*, 71, 371, 1983.
138. Mansfield, L. E., Ting, S., Haverly, R. W., and Yoo, T. J., The incidence and clinical implications of hypersensitivity to papain in an allergic population confirmed by blinded oral challenge, *Ann. Allergy*, 55, 541, 1985.

139. Martin, J. A., Compaired, J. A., de la Hoz, B., Alonso, M. D., Igea, J. M., Hinojosa, M., and Sanchez, M., Bronchial asthma induced by legumes, *Schweiz Med. Wochenschr.*, 121(Abstr., Suppl. 40), 82, 1991.
140. Martin, J. A., Compaired, J. A., de la Hoz, B., Quirce, S., Alonso, M. D., Igea, J. M., and Losada, E., Bronchial asthma induced by chick pea and lentil, *Allergy*, 47, 185, 1992.
141. Martin-Munoz, F., Lopez Cazana, J. M., Villas, F., Contreras, J. F., Diaz, J. M., and Ojeda, J. A., Exercise-induced anaphylaxic reaction to hazelnut, *Allergy*, 49, 314, 1994.
142. Maslansky, L., and Wein, G., Chocolate allergy: a double-blind study, *Conn. Med.*, 35, 5, 1971.
143. Maulitz, R. M., Pratt, D. S., and Schocket, A. L., Exercise-induced anaphylactic reaction to shellfish, *J. Allergy Clin. Immunol.*, 63, 433, 1979.
144. May, K. L., Allergy to cereals and dairy products in adult, uncomplicated asthma: an epidemiological survey. *Allergol. Immunopathol.*, 8, 643, 1980.
145. McNeil, D., and Strauss, R. H., Exercise-induced anaphylaxis related to food intake, *Ann. Allergy*, 61, 440, 1988.
146. Meding, B., Immediate hypersensitivity to mustard and rape, *Contact Dermatitis*, 13, 121, 1985.
147. Michaels, D. L., Amaranth seed anaphylaxis, *Proc. Annu. Meet Am. Col. Allergy*, 124(Abstr.), 1986.
148. Michaelsson, G., and Juhlin, L., Urticaria induced by preservatives and dye additives in food and drugs, *Br. J. Dermatol.*, 88, 525, 1973.
149. Miell, J., Papouchado, M., and Marshall, A. J., Anaphylactic reaction after eating a mango, *Br. Med. J.*, 297, 1639, 1988.
150. Mikkelsen, R., Larsen, J. C., and Tarding, F., Hypersensitivity reactions to food colours with special reference to the natural colour annatto extract (butter color), *Arch. Toxicol.*, 1(Suppl.), 141, 1978.
151. Millard, L., Acute contact sensitivity to a new toothpaste, *J. Dentistry*, 1, 168, 1973.
152. Mitchell, J. C., Patch testing with some components of Balsam of Peru, *Contact Dermatitis*, 1, 391, 1975.
153. Moneret-Vautrin, D. A., Hatahet, R., Kanny, G., and Ait-Djafer, Z., Allergenic peanut oil in milk formulas, *Lancet*, 338, 1149, 1991.
154. Monreal, P., Botey, J., Pena, M., Marin, A., and Eseverri, J. L., Mustard allergy. Two anaphylactic reactions to ingestion of mustard sauce, *Ann. Allergy*, 69, 317, 1992.
155. Moral, A., Tornero, P., Pascual, C., Olalde, S., San Juan, A., and Herrero, T., Sensitization to rubber and banana: a case report, *Schweiz Med. Wochenschr.*, 121(Abstr., Suppl. 40), 81, 1991.
156. Morgan, J. E., Daul, C. B., and Lehrer, S. B., Shrimp allergy: relationship of challenge responses to immunologic reactivity, *J. Allergy Clin. Immunol.*, 77(Abstr.), 238, 1986.
157. Morikawa, A., Kalo, M., Tokuyama, K., Tajima, K., and Kuroume, T., Anaphylaxis due to grand keyhole limpet (baby abalone–like shellfish), *N. Engl. Reg. Allergy Proc.*, 9(Abstr.), 406, 1988.
158. M'Raihi, L., Charpin, D., Pons, A., Bongrand, P., and Vervloet, D., Cross-reactivity between latex and banana, *J. Allergy Clin. Immunol.*, 87, 129, 1991.
159. Munoz, D., Leanizbarrutia, I., Lobera, T., and Fernandez de Corres, L., Anaphylaxis from contact with carrot, *Contact Dermatitis*, 13, 345, 1985.
160. Musken, H., Schwarz, H., Wahl, R., and Klein-Tebbe, J., Food allergy due to rice, *Schweiz Med. Wochenschr.*, 121(Abstr., Suppl. 40), 81, 1991.
161. Musmand, J. J., Helbling, A., EI-Dahr, J., and Lehrer, S. B., An immediate reaction to canned tuna fish in a highly sensitive, fish-allergic individual. *Ann. Allergy*, 71(Abstr.), 265, 1993.

162. Muthiah, R. and Kagen, S., Food allergens: isolation and characterization of major buckwheat carbohydrate-dependent allergens, *J. Allergy Clin. Immunol.*, 85(Abstr.), 151, 1990.
163. Nakamura, T., Shiitake (*Lentinus edodes*) dermatitis, *Contact Dermatitis*, 27, 65, 1992.
164. Nater, J. P., and Zwartz, J. A., Atopic allergic reactions due to raw potato, *J. Allergy*, 40, 202, 1967.
165. Nielsen, N. H., Systemic allergic reaction to pine nuts, *Ann. Allergy*, 64, 132, 1990.
166. Niinimaki, A., Delayed-type allergy to spices, *Contact Dermatitis*, 11, 34, 1984.
167. Niinimaki, A., Bjorksten, F., Puukka, M., Tolonen, K., and Hannuksela, M., Spice allergy: results of skin prick tests and RAST with spice extracts, *Allergy*, 44, 60, 1989.
168. Niinimaki, A. and Hannuksela, M., Immediate skin test reactions to spices, *Allergy*, 36, 487, 1981.
169. Nish, W. A., Whisman, B. A., Goetz. D. W., and Ramirez, D. A., Anaphylaxis to annatto dye: a case report, *Ann. Allergy*, 66, 129, 1991.
170. Nishioka, K., Katayama, I., and Sano, S., Urticaria induced by D-psicose, *Lancet*, 2, 1417, 1983.
171. Nishioka, K., Katayama, I., Sano, S., Numata, T., and Yamamoto, S., Monosaccharide in high fructose corn syrup as an etiological factor of urticaria. *J. Dermatol.*, 11, 391, 1984.
172. Norgaard, A., and Bindslev-Jensen, C., Egg and milk allergy in adults: Diagnosis and characterization, *Allergy*, 47, 503, 1992.
173. Novembre, E., de Martino, M., and Vierucci, A., Foods and respiratory allergy, *J. Allergy Clin. Immunol.*, 81, 1059, 1988.
174. Noyes, J. H., Boyd, G. K., and Settipane, G. A., Anaphylaxis to sunflower seed, *J. Allergy Clin. Immunol.*, 63, 242, 1979.
175. Olalde, S., Bensabat, Z., Vives, R., Fernandez, L., Cabeza, N. C., and Rodriguez, J., Allergy to cow's milk with onset in adult life, *Ann. Allergy*, 62, 185a, 1989.
176. O'Neil, C., McCants, M., Gutman, A., and Lehrer, S., Anaphylaxis following ingestion of candy: identification of the etiologic agent, *N. Engl. Reg. Allergy Proc.*, 9(Abstr.), 279, 1988.
177. Ortolani, C., Ispano, M., Pastorella, E. A., Ansaloni, R., and Magri, G. C., Comparison of results of skin prick tests with fresh foods and commercial food extracts and RAST in 100 patients with oral allergy syndrome, *J. Allergy Clin. Immunol.*, 83, 683, 1989.
178. Panconesi, E., Sertoli, A., Fabbri, P., Giorgini, S., and Spallanzani, P., Anaphylactic shock from mustard after ingestion of pizza, *Contact Dermatitis*, 6, 294, 1980.
179. Parker, J. L., Yunginger, J. W., and Swedlund, H. A., Anaphylaxis after ingestion of millet seeds, *J. Allergy Clin. Immunol.*, 67, 78, 1981.
180. Parker, S. L., Leznoff, A., Sussman, G. L., Tarlo, S. M., and Krondl, M., Characteristics of patients with food-related complaints, *J. Allergy Clin. Immunol.*, 86, 503, 1990.
181. Parra, F. M., Cuevas, M., Lezaun, A., Alonso, M. D., Beristain, A. M., and Losada, E., Pistachio nut hypersensitivity: identification of pistachio nut allergens, *Clin. Exp. Allergy*, 23, 996, 1993.
182. Parra, F. M., Lazaro, M., Cuevas, M., Ferrando, M. C., Martin, J. A., Lezaun, A., Alonso, M. D., and Sanchez-Cano, M., Bronchial asthma caused by two unrelated vegetables, *Ann. Allergy*, 70, 324, 1993.
183. Pauli, G., Bessot, J. C., Dietemann-Molard, A., Braun, P. A., and Thierry, R., Celery sensitivity: clinical and immunological correlations with pollen allergy, *Clin. Allergy*, 15, 273, 1985.
184. Pauli, G., Bessot, J. C., Braun, P. A., Dietemann-Molard, A., Kopferschmitt-Kubler, M. C., and Thierry, R., Celery allergy: clinical and biological study of 20 cases, *Ann. Allergy*, 60, 243, 1988.
185. Pearson, R. S. B., Potato sensitivity, an occupational allergy in housewives, *Acta Allergol.*, 21, 507, 1966.

186. Pigatto, P. D., Bigardi, A., Fumagalli, M., Legori, A., and Altomare, G. F., IgE-mediated contact and generalized urticaria from *Eruca sative*, *Contact Dermatitis*, 25, 191, 1991.
187. Pigatto, P. D., Riva, F., Altomare, G. F., and Parotelli, R., Short-term anaphylactic antibodies in contact urticaria and generalized anaphylaxis to apple, *Contact Dermatitis*, 9, 511, 1983.
188. Ratner, B., Untracht, S., Malone, H. J., and Retsina, M., Allergenicity of modified and processed foodstuffs. IV. Orange: allergenicity of orange studied in man, *J. Pediatr.*, 43, 421, 1952.
189. Ring, J., Langehenke, H., and Przybilla, B., White sausage anaphylaxis: a detective story, *Allergy Clin. Immunol. News*, 1, 11, 1989.
190. Rodriguez, M., Vega, F., Garcia, M. T., Panizo, C., Laffond, E., Montalvo, A., and Cuevas, M., Hypersensitivity to latex, chestnut, and banana, *Ann. Allergy*, 10, 31, 1993.
191. Roed-Petersen, J., and Hjorth, N., Patch test sensitization from d,1-alpha-tocopherol (vitamin E), *Contact Dermatitis*, 1, 391, 1975.
192. Romano, A., Di Fonso, M., Venuti, A., Palmieri, V., and Zeppilli, P., Food-dependent exercise-induced anaphylaxis: report of two cases, *Int. J. Sports Med.*, 13, 585, 1992.
193. Rose, M. H., and Altman, L. C., Letter to the editor, *Ann. Allergy*, 54, 166, 1985.
194. Rosenberg, S., Landay, R., Klotz, S. D., and Fireman, P., Serum IgE antibodies to psyllium in individuals allergic to psyllium and English plantain, *Ann. Allergy*, 48, 294, 1982.
195. Rubin, J. M., Shapiro, J., Muehlbauer, P., and Grolnick, M., Shock reaction following ingestion of mango, *J. Am. Med. Assoc.*, 193, 397, 1965.
196. Rubinger, D., Friedlander, M., and Superstine, E., Hypersensitivity to tablet additives in transplant recipients on prednisone, *Lancet*, 2, 689, 1978.
197. Sagona, M. A., Bruszer, G. V., Lin, L., Pearson, F. C., Serkes, K., and Mascoli, C. C., Evaluation of papain/chymopapain cross allergenicity, *J. Allergy Clin. Immunol.*, 76, 776, 1985.
198. Sampson, H. A., Role of immediate food hypersensitivity in the pathogenesis of atopic dermatitis, *J. Allergy Clin. Immunol.*, 71, 473, 1983.
199. Sampson, H. A., Comparative study of commercial food antigen extracts for the diagnosis of food hypersensitivity, *J. Allergy Clin. Immunol.*, 82, 718, 1988.
200. Sampson, H. A., The immunopathogenic role of food hypersensitivity in atopic dermatitis, *Acta Derm. Venereol.* (Stockh.), 176(Suppl.), 34, 1992.
201. Sampson, H. A., and Albergo, R., Comparison of results of skin tests, RAST, and double-blind, placebo-controlled food challenges in children with atopic dennatitis, *J. Allergy Clin. Immunol.*, 74, 26, 1984.
202. Sampson, H. A., and McCaskill, C. C., Food hypersensitivity and atopic dermatitis: evaluation of 113 patients, *J. Pediatr.*, 105, 669, 1985.
203. Sampson, H. A., and Scanlon, S. M., Natural history of food hypersensitivity in children with atopic dermatitis, *J. Pediatr.*, 115, 23, 1989.
204. Sampson, H. A., Mendelson, L., and Rosen, J. P., Fatal and near-fatal anaphylaxis to food in children and adolescents, *N. Engl. J. Med.*, 327, 380, 1992.
205. Savonius, B., and Kanerva, L., Anaphylaxis caused by banana, *Allergy*, 48, 215, 1993.
206. Scrimshaw, N. S., and Dillon, J. C., Allergic responses to some single-cell proteins in human subjects, in *Single Cell Protein; Safety for Animal and Human Feeding*, Garattini, S., Paglialunga, S., and Scrimshaw, N. S., Eds., Pergamon Press, Oxford, 1979, 171.
207. Shibasaki, M., Suzuki, S., Nemoto, H., and Kuroume, T., Allergenicity and lymphocyte stimulating property of rice protein, *J. Allergy Clin. Immunol.*, 64, 259, 1979.

208. Shibasaki, M., Ehara, T., and Takita, H., Late anaphylactic reaction to cuttlefish, *Ann. Allergy*, 63, 421, 1989.

209. Silvers, S. H., Stomatitis and dermatitis venanata with purpura, resulting from oil of cloves and oil of cassia, *Dent. Items Interest*, 61, 649, 1939.

210. Silverstein, S. R., Frommer, D. A., Dovozin, B., and Rosen, P., Celery-dependent exercise-induced anaphylaxis, *J. Emerg. Med.*, 4, 195, 1986.

211. Simpson, S. I., Somerfield, S. D., Wilson, J. D., and Hillas, J. L., A double-blind study for the diagnosis of cows' milk allergy, *N. Z. Med. J.*, 92, 457, 1980.

212. Sonnex, T. S., Dawber, R. P.R., and Ryan, T. J., Mucosal contact dermatitis due to instant coffee, *Contact Dennatitis*, 7, 298, 1981.

213. Stager, J., Wuthrich, B., and Johansson, S. G. O., Spice allergy in celery-sensitive patients, *Allergy*, 46, 475, 1991.

214. Stricker, W. E., Anorve-Lopez, E.,and Reed, C. E., Food skin testing in patients with "idiopathic anaphylaxis," *J. Allergy Clin. Immunol.*, 77, 516, 1986.

215. Strunk, R. C., Pinnas, J. L., John, T. J., Hansen, R. C., and Blazovich, J. L., Rice hypersensitivity associated with serum complement depression, *Clin. Allergy*, 8, 51, 1978.

216. Subiza, J., Subiza, J. L., Hinojosa, M., Garcia, R., Jerez, M., Valdivieso, R., and Subiza, E., Anaphylactic reaction after the ingestion of chamomile tea: a study of cross-reactivity with other composite pollens, *J. Allergy Clin. Immunol.*, 84, 353, 1989.

217. Sutton, R., Hill, D. J., Baldo, B. A., and Wrigley, C. W., Immunoglobulin E antibodies to ingested cereal flour components: studies with sera from subjects with asthma and eczema, *Clin. Allergy*, 12, 63, 1982.

218. Tarvainen, K., Solonen, J. P., Kanerva, L., Estlander, T., Keskinen, H., and Rantanen, T., Allergy and toxicodermia from shiitake mushrooms, *J. Am. Acad. Dermatol.*, 24, 64, 1991.

219. Taylor, S. L., Busse, W. W., Sachs, M. I., Parker, J. L., and Yunginger, J. W., Peanut oil is not allergenic to peanut-sensitive individuals, *J. Allergy Clin. Immunol.*, 68, 372, 1981.

220. Taylor, S., White, L., Kapels, L., Nordlee, J., Hoffman, M., Kiechel, F., and Sullivan, M., Identification of IgE-binding proteins from peaches by immunoblotting, *J. Allergy Clin. Immunol.*, 89 (Abstr.), 193, 1992.

221. Tee, R. D., Gordon, D. J., Welch, J. A. , and Newman-Taylor, A. J., Investigation of possible allergic reaction to mycoprotein ("Quorn"), *Clin. Exp. Allergy*, 24, 257, 1993.

222. Temesvari, E., Soos, G., Podanyi, B., Kovacs, I., and Nemeth, I., Contact urticaria provoked by Balsam of Peru, *Contact Dermatitis*, 4, 65, 1978.

223. Urisu, A., Yamada, K., Masuda, S., Komada, H., Wada, E., Kondo, Y., Horiba, F., Tsuruta, M., Yasaki, T., Yamada, M., Torii, S., and Nakamura, R., 16-Kilodalton rice protein is one of the major allergens in rice grain extract responsible for cross-allergenicity between cereal grains in the Poaceae family, *Int. Arch. Allergy Appl. Immunol.*, 96, 244, 1991.

224. Vallier, P., Dechamp, C., Vial, O., and Deviller, P., A study of allergens in celery with cross-sensitivity to mugwort and birch pollens, *Clin. Allergy*, 18, 491, 1988.

225. van Asperen, P. P., and Chong, A., Vegamite allergy, *Med. J. Aust.*, 142, 236, 1985.

226. van den Hoogenband, H. M., and van Ketel, W. G., Allergy to rice, *Contact Dermatitis*, 9, 527, 1983.

227. van Ketel, W. G., Immediate type allergy to malt in beer, *Contact Dermatitis*, 6, 297, 1980.

228. van Ketel, W. G., Skin eruptions caused by vegetables and fruits including pears, *Contact Dermatitis*, 8, 352, 1982.

229. van Toorenenbergen, A. W., and Dieges, P. H., IgE-Mediated hypersensitivity to taugeh (sprouted small green beans), *Ann. Allergy*, 53, 239, 1984.
230. van Toorenenbergen, A. W., and Dieges, P. H., Demonstration of spice-specific IgE in patients with suspected food allergies, *J. Allergy Clin. Immunol.*, 79, 108, 1987.
231. van Toorenenbergen, A. W., Huijskes-Heins, M. I. E., Leijnse, B., and Dieges, P. H., Immunoblot analysis of IgE-binding antigens in spices, *Int. Arch. Allergy Appl. Immunol.*, 86, 117, 1988.
232. Veien, N. K., Hattel, T., Justesen, O., and Norholm, A., Oral challenge with Balsam of Peru in patients with eczema: a preliminary study, *Contact Dermatitis*, 9, 75, 1983.
233. Veraldi, S., and Schianchi-Veraldi, R., Contact urticaria from kiwi fruit, *Contact Dermatitis*, 22, 244, 1990.
234. Vervloet, D., Tafforeau, M., Charpin, J., Birnbaum, J., and Charpin, D., Cross-reactivity between sunflower honey and celery, *J. Allergy Clin. Immunol.*, 81(Abstr.), 265, 1988.
235. Vitoria, J. C., Camerero, C., Sojo, A., Ruiz, A., and Rodriguez-Soriano, J., Enteropathy related to fish, rice, and chicken, *Arch. Dis. Child.*, 57, 44, 1982.
236. Voeks, E., Seifert, B., Seifert, H. U., and Borelli, S., IgE-mediated reaction to kiwifruit: case report of eight patients (in German), *Munch Med. Wochenschr.*, 130, 419, 1988.
237. Voeks, E., Borga, A., Szliska, C., Seifert, H. U., Seifert, B., Burow, G., and Borelli, S., Common allergenic structures in hazelnut, rye grain, sesame seeds, kiwi, and poppy seeds, *Allergy*, 48, 168, 1993.
238. Vouillot, C., deBlay, F., Thierry, R., Simon, B., Mahr, L., and Pauli, G., Chicken albumin responsible for cross-sensitivity between eggs and chicken liver and flesh, *J. Allergy Clin. Immunol.*, 89(Abstr.), 194, 1992.
239. Wadee, A. A., Doting, L. A., and Rabson, A. R., Fruit allergy: demonstration of IgE antibodies to a 30-kDa protein present in several fruits, *J. Allergy Clin. Immunol.*, 85, 801, 1990.
240. Wahl, R., and Kleinhans, D., IgE-mediated allergic reaction to fruit gums and investigation of cross-reactivity between gelatine and modified gelatine-containing products, *Clin. Exp. Allergy*, 19, 77, 1989.
241. Wahl, R., Lau, S., Maasch, H. J., and Wahn, U., IgE-medicated allergic reactions to potatoes, *Int. Arch. Allergy Appl. Immunol.*, 92, 168, 1990.
242. Watanabe, M., Hypoallergenic rice as a physiologically functional food, *Trends Food Sci. Technol.*, 4, 125, 1993.
243. Watanabe, M., Miyakawa, J., Ikezawa, Z., Suzuki, Y., Hirao, T., Yoshizawa, T., and Arai, S., Production of hypoallergenic rice by enzymatic decomposition of constituent proteins, *J. Food Sci.*, 55, 781, 1990.
244. Watson, W. T. A., Simons, F. E. R., Roberts, J. R., and Becker, A. B., Food hypersensitivity and changes in airway function, *J. Allergy Clin. Immunol.*, 89(Abstr.), 184, 1992.
245. Weber, R. W., Hoffman, M., Raine, D. A., and Nelson, H. S., Incidence of bronchoconstriction due to aspirin, azo dyes, non-azo dyes, and preservatives in a population of perennial asthmatics, *J. Allergy Clin. Immunol.*, 64, 32, 1979.
246. Werfel, S., Cooke, S., and Sampson, H. A., Clinical reactivity to beef in cow milk allergic (CMA) children, *J. Allergy Clin. Immunol.*, 89(Abstr.), 228, 1992.
247. White, I. R., and Calnan, C. D., Contact urticaria to fruit and birch sensitivity, *Contact Dermatitis*, 9, 164, 1983.
248. Widstrom, L., and Johansson, S. G. O., IgE-mediated anaphylaxis to mustard, *Acta. Derm. Venereal.* (Stockh.), 66, 70, 1986.

249. Williamson, J. W., Anaphylactoid reaction to oranges, *J. Fla. Med. Assoc.*, September, 247, 1961.
250. Wuthrich, B., and Dietschi, R., Celery-carrot-mugwort-spice syndrome: Skin test and RAST results (in German), *Schweiz Med. Wochenschr.*, 115, 258, 1985.
251. Wuthrich, B., Stager, J., and Johansson, S. G. O., Celery allergy associated with birch and mugwort pollinosis, *Allergy*, 45, 566, 1990.
252. Yeates, H. M., Jenson, K. K., and Orem, U. T., Chronic anaphylaxis caused by ingestion of vegetable gum products, *J. Allergy Clin. Immunol.*, 87(Abstr.), 274, 1991.
253. Yunginger, J. W., Sweeney, K. G., Sturner, W. Q., Giannandrea, L. A., Teigland, J. D., Bray, M., Benson, P. A., York, J. A., Biedrzycki, L., Squillace, D. L., and Helm, R. M., Fatal food-induced anaphylaxis, *J. Am. Med. Assoc.*, 260, 1450, 1988.
254. Yunginger, J. W., Squillace, D. L., Jones, R. T., and Helm, R. M., Fatal anaphylactic reactions induced by peanuts, *Allergy Proc.*, 10, 249, 1989.
255. Yunginger, J. W., Nelson, D. R., Squillace, D. L., Jones, R. T., Holley, K. E., Hyma, B. A., Biedrzycki, L., Sweeney, K. G., Sturner, W. Q., and Schwartz, L. B., Laboratory investigation of deaths due to anaphylaxis, *J. Forensic Sci.*, 36, 857, 1991.
256. Zeitz, H. J., Cato, M., LeKach, R., Thomas, L., Jarmoszuk, I., and Samter, M., Reactions to specific foods in adults, *J. Allergy Clin. Immunol.*, 77(Abstr.), 238, 1986.
257. Zhu, S. L., Ye, S. T., and Yu, Y., Allergenicity of orange juice and orange seeds: a clinical study, *Asian Pac. J. Allergy Immunol.*, 7, 5, 1989.
258. Zina, A. M., and Bundino, S., Contact urticaria to *Actinidia chinensis* (kiwi), *Contact Dermatitis*, 9, 85, 1983.

References (Bibliography)

1. Taylor, S. L., Chemistry of food allergens, *Comments Agric. Food Chem.*, 1, 51, 1987.
2. Food and Agriculture Organization of the United Nations, Report of the FAO Technical Consultation on Food Allergies. Rome, Italy, November 13 to 14, 1995.
3. Parker, S. L., Leznoff, A., Sussman, G. L., Tarlo, S. M., and Krondl, M., Characteristics of patients with food-related complaints, *J. Allergy Clin. Immunol.*, 86, 503, 1990.
4. Aas, K., Studies of hypersensitivity to fish: a clinical study, *Int. Arch. Allergy*, 29, 346, 1966.
5. Bock, S. A., A critical evaluation of clinical trials in adverse reactions to foods in children, *J. Allergy Clin. Immunol.*, 78, 165, 1986.
6. Sampson, H. A., and Albergo, R., Comparison of results of skin tests, RAST, and double-blind, placebo-controlled food challenges in children with atopic dermatitis, *J. Allergy Clin. Immunol.*, 74, 26, 1984.