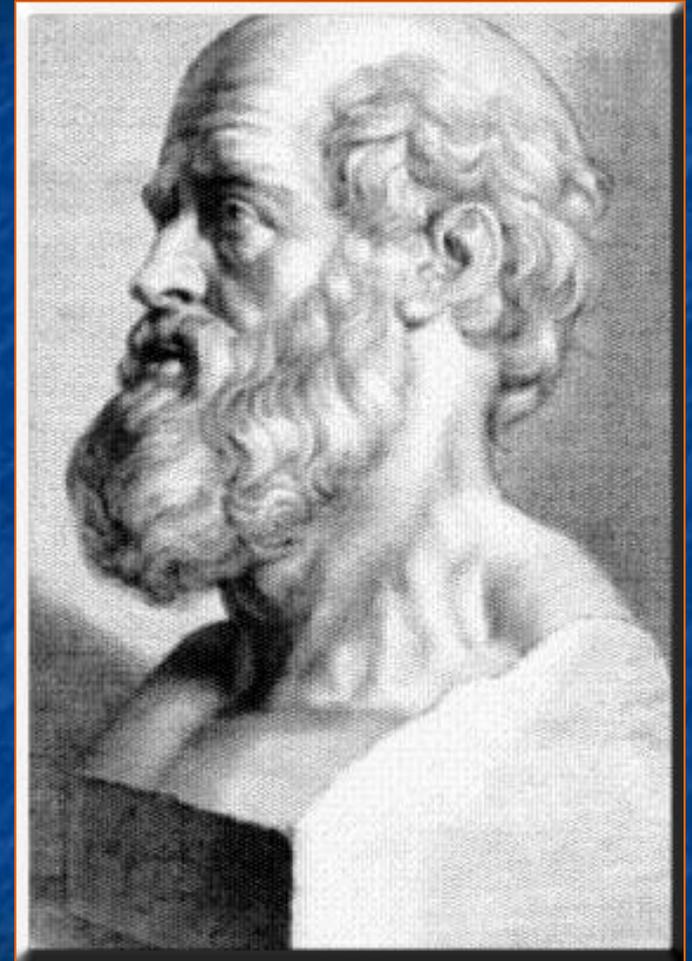


Alergia Alimentar

- 2300 anos: Hipócrates observou que o LV → desconforto abdominal, cefaléia e urticária.
- Reação adversa ao alimento: qualquer reação anormal decorrente da ingestão de um alimento ou aditivo alimentar.
 - Reação tóxica: independe da sensibilidade ou exposição prévia (histamina em peixes).
 - Reação não tóxica: dependem da sensibilidade individual que podem resultar de reações mediadas por mecanismos imunológicos ou outros mecanismos.



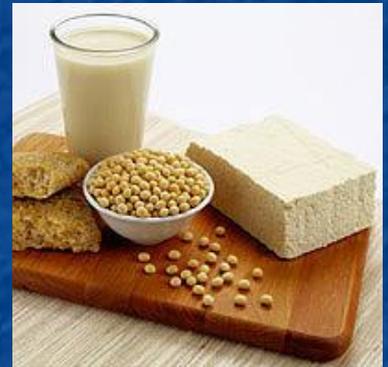
Alergia Alimentar

- Alergia ou hipersensibilidade alimentar: envolve um mecanismo imunológico, dependente de antígeno presente nas proteínas dos alimentos
- Intolerância alimentar: não intermediado por mecanismo imune (intolerância à lactose).
- Alergia alimentar ocorre com mais frequência nos primeiros anos de vida (2 a 30%).
- Lactentes ← proteína do leite de vaca; em geral aos 2 ou 3 anos já apresenta tolerância.
- Fração do alimento responsável pela alergia: glicoproteína com peso molecular entre 10 a 70 kD.



Processo alérgico



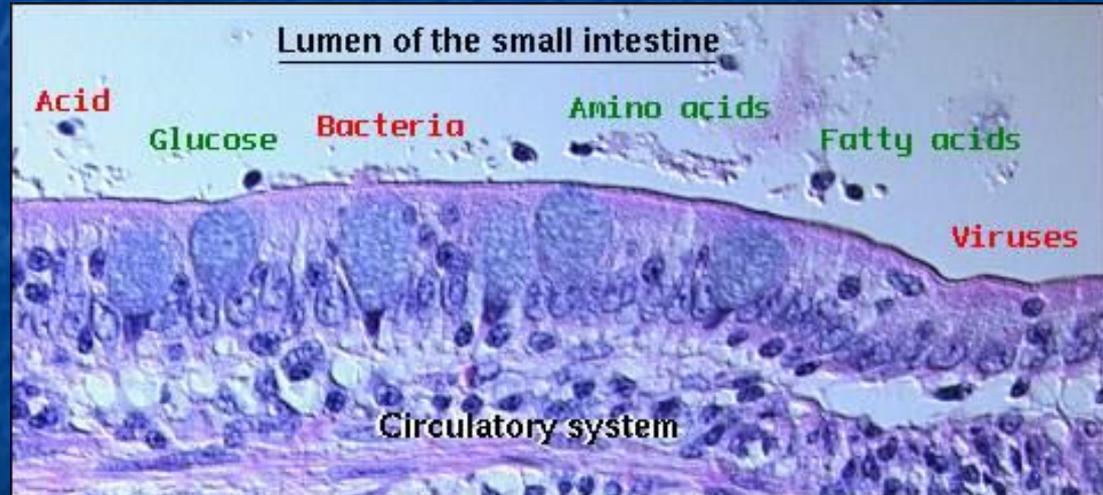
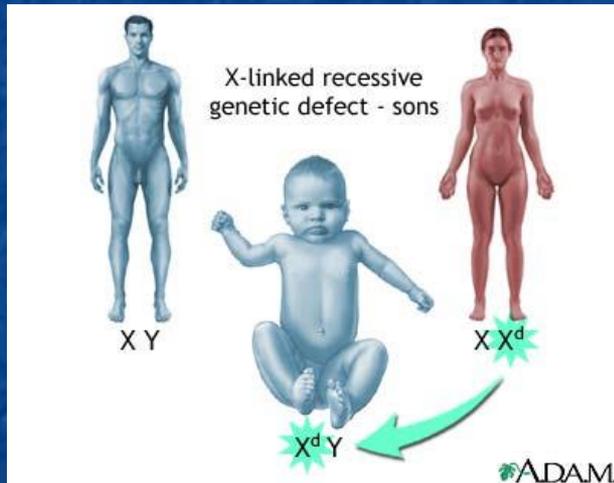


Alimentos alergênicos e suas proteínas antigênicas

Leite de vaca	β -lactoglobulina; α , β , κ -caseína; α -lactoalbumina
Clara de ovo	Ovomucóide, ovoalbumina, ovotransferrina
Amendoim	Vicilina, cong lutina, glicinina
Soja	Vicilina, conglicina
Peixe	Parvalbumina
Camarão	Tropomiosina
Catania do pará	Albumina-2S
Nozes	Albumina 2S
Arroz	Inibidor da alfa-amilase
Trigo	Inibidor da alfa-amilase
Mostarda	Albumina-2S

Antígeno (glicoproteína)

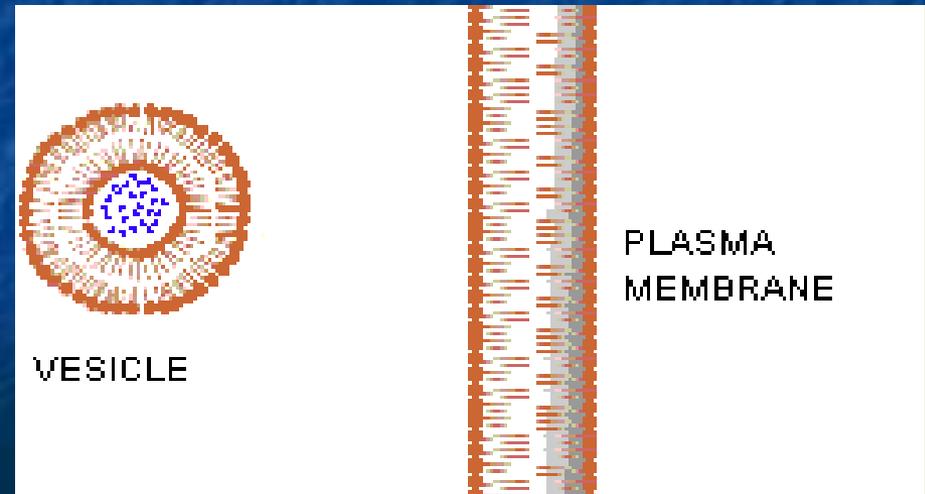
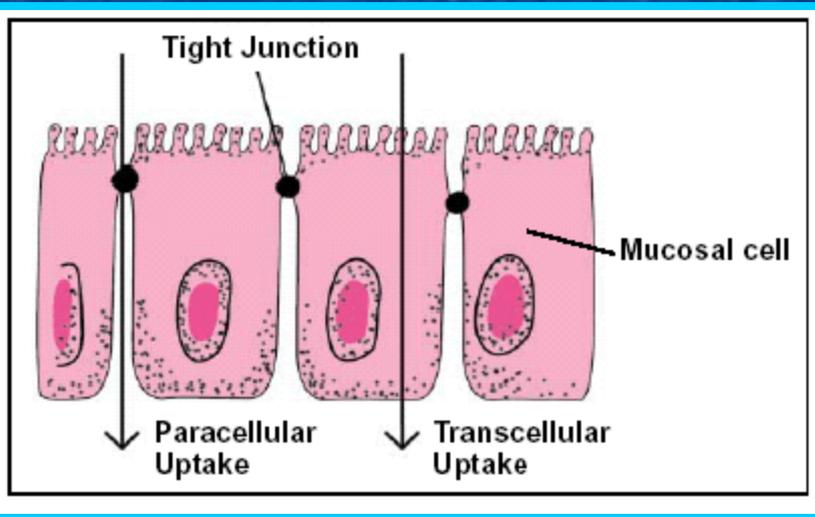
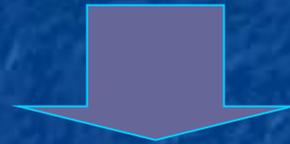
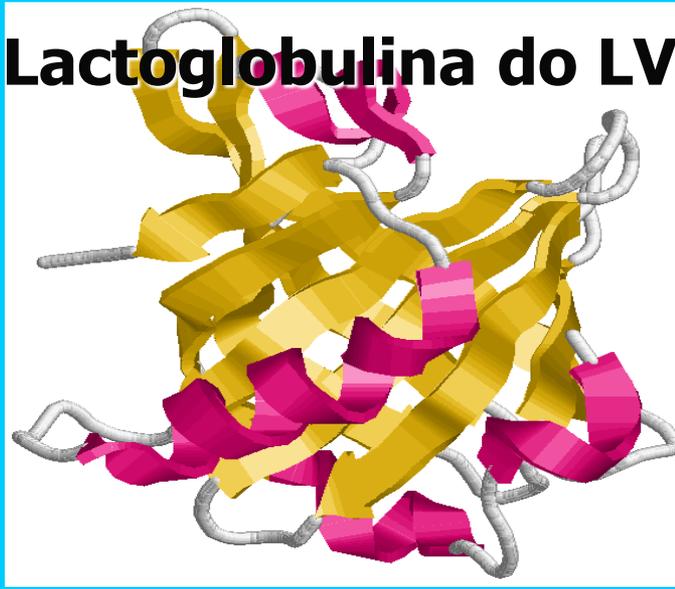
- Barreira ácida gástrica
- Muco
- Peristaltismo intestinal
- Integridade da mucosa



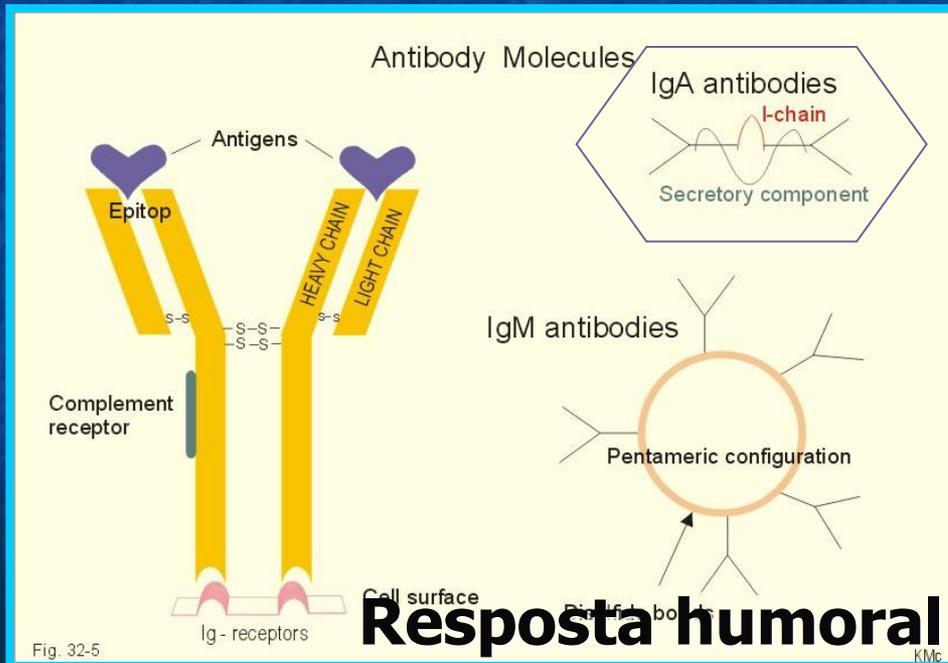
Genética (RR = 30%)

**Permeabilidade do trato
gastrointestinal**

Lactoglobulina do LV



Resposta mediada por célula

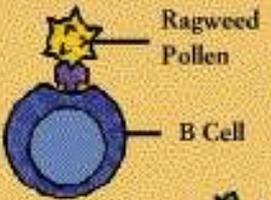


A alergia alimentar é mais comum em indivíduos e mediadas por IgA, IgM, IgE, IgG.

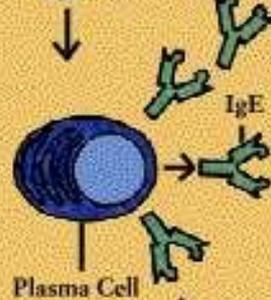
Alergia Alimentar: reações anafiláticas ou imediatas



- Reações do Tipo 1: Mediadas por IgE → liberam mediadores (histamina, serotonina, heparina) → prurido, contração da musculatura lisa, vasodilatação, aumento da permeabilidade vascular, liberação de citocinas.
- Alergia alimentar com manifestações digestivas → reações do tipo 4.
- Alergia alimentar: mediada por IgE; parcialmente mediada por IgE; mediada por células.



The first time the allergy-prone person runs across an allergen such as ragweed,



he or she makes large amounts of ragweed IgE antibody.

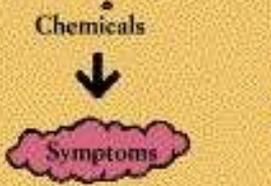


These IgE molecules attach themselves to mast cells.

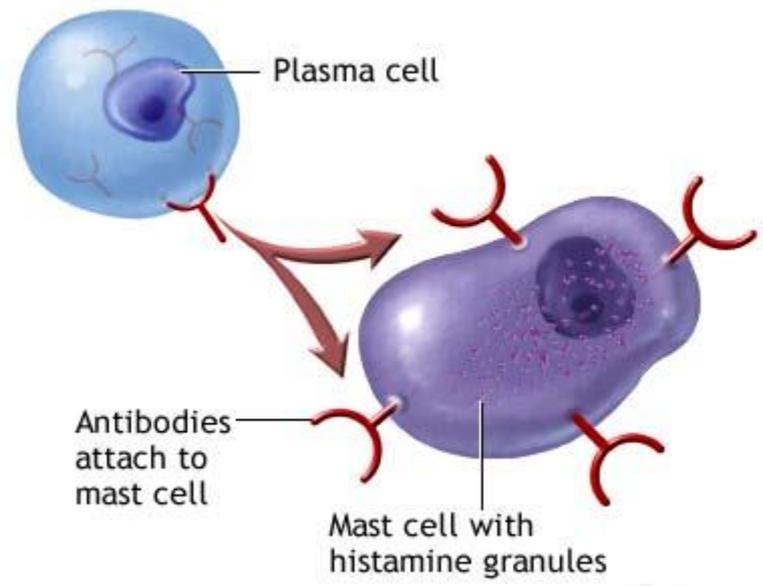


The second time that person has a brush with ragweed,

the IgE-primed mast cell will release its powerful chemicals,

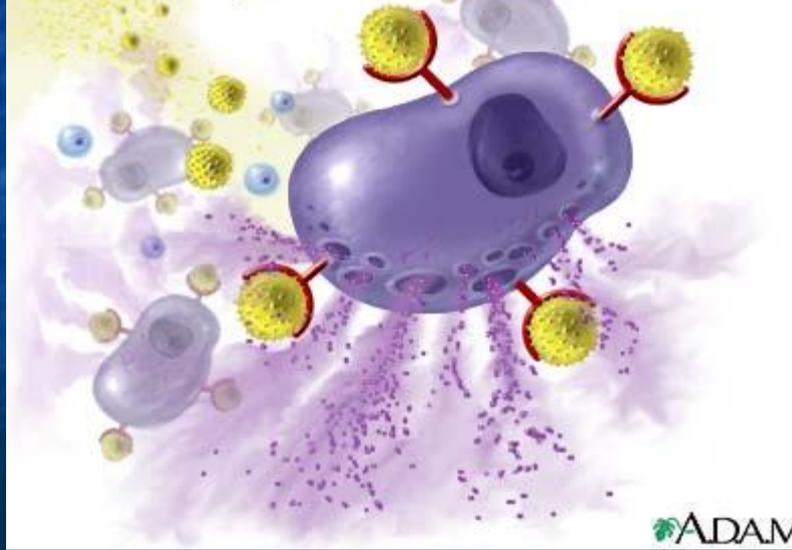


and the person will suffer the wheezing and/or sneezing, runny nose, watery eyes, and itching of allergy.



ADAM.

Mast cells release histamines when the allergen is encountered



ADAM.

Alergia Alimentar: manifestações clínicas

➤ Anafilaxia sistêmica mediada por IgE → náuseas, vômitos, dor abdominal, prurido, edema de glote, cianose, hipotensão arterial, choque e arritmias cardíacas, morte.



Alergia Alimentar: manifestações clínicas

➤ Síndrome alérgica oral: acomete a orofaringe (prurido, queimação, edema dos lábios, de língua, de palato e de faringe). ← antígenos inalatórios como o pólen: ingestão de banana, frutas cítricas, maçã, kiwi, melão, tomate, cenoura, salsão (se cozidos não tem reação alérgica).





Alergia Alimentar: manifestações clínicas

- Alergia digestória imediata: 2 horas após ingestão do alimento → náuseas, vômitos, dor, distensão abdominal, flatulência, diarreia, hipotonia gástrica, piloroespasmo, alteração na peristalse intestinal, manifestações cutâneas e pulmonares.
- Gastroenteropatia eosinofílica: Esofagite, gastrite, gastroenterite, perda de proteína pelo tubo digestivo, hipoalbuminemia ← reação de hipersensibilidade a múltiplos alimentos

Alergia Alimentar

Alergia ao leite de vaca → refluxo
gastroesofágico ← possibilidade de alergia
alimentar



Enterite por alergia alimentar

Alergia Alimentar



Enterite por alergia alimentar



Primeiro trimestre de vida → diarréia grave, distúrbio hidro-eletrolítico, subnutrição, sangue nas fezes, anemia ← melhora clínica com a retirada do LV (prevalência = 5,7%)

Distúrbio da motilidade gastroesofágica induzida por proteínas do leite de vaca

Alergia Alimentar: manifestações clínicas

- Colite alérgica ← transmissão de alérgenos pelo LM de alimentos ingeridos pela mãe (leite de vaca e proteína da soja) → diarreia com sangue, anemia ferropriva, infiltrado de eosinófilo no reto.



Alergia Alimentar: manifestações clínicas

Lactente + LV → alergia → constipação





Intolerância à lactose do LV \neq Alergia ao LV



Qual a diferença do tratamento?

Alergia Alimentar: diagnóstico

- Resultado clínico da dieta de exclusão e no teste de desafio ou desencadeamento (esse último deve ser evitado em casos com risco de reação anafilática).
- Hemograma compatível com anemia; ↓ ferritina.
- Eosinofilia
- ↑ IgE
- Biópsias do TGI em lactentes.

Alergia Alimentar: tratamento

- Exclusão do alimento.
- Dieta balanceada.
- Suplementação de cálcio se exclusão de leite.
- Fórmulas substitutas ao LV: leite de cabra, fórmula de soja, fórmula semi-elementar, fórmula elementar
- Leite de cabra (lactose), leite de soja (glicoproteína): sensibilização do paciente.

Alergia Alimentar: tratamento



- Fórmulas semi-elementares: não eficazes em $< 5\%$ dos casos.
- Criança maior e adolescente: se alergia ao camarão ou abacaxi → fácil dieta de exclusão
- Alergia a múltiplos alimentos → dieta semi-alimentar ou elementar
- Uso de corticóides pode ser necessário

Alergia Alimentar: prevenção

- Exclusão de alimentos alergênicos pela mãe não previne alergia do bebê.
- Aleitamento materno prolongado
- Probiótico pode ↓ passagem de macromoléculas íntegras pela barreira gastrointestinal.

Marcha alérgica

Aumentam a marcha alérgica	
Antecedentes genéticos	+++
Sensibilização precoce e persistente	+++
Contato intenso com alérgicos	+++
Reduzido contato com MOG	+++
Fatores ambientais	+++
Situação de fumante passivo	++

Marcha alérgica

Pouca higiene

Elevada carga microbiana

Vírus, bactérias

Alérgenos



↑↑↑↑ IFN- γ , IL-12; IFN- α , IL-10

Estimula a resposta Th1

Inibe a resposta Th2

Muita higiene

Reduzida carga microbiana

Vírus, bactérias

Alérgenos



↓↓↓↓ IFN- γ , IL-12; IFN- α , IL-10

Estimula a resposta Th2

Marcha alérgica

Diminuem a marcha alérgica	
LM, hidrolizado nos primeiros meses de vida	+++
Administração de sólidos após os 4 meses	+
Eliminação de pó caseiro nos primeiros meses de vida	++
Probióticos (bifidobactérias)	++
Imunoterapia	+
Anti-histamínicos	+
↑ômega 3, ↑ zinco, ↑ ferro, ↑ nucleotídeos	?

Leite materno e propriedades contra infecções

- IgA contra patógenos
- Lactoferrina
- Lisozima
- Oligossacarídeos
- Glicoconjugados
- Lipídios

Propriedades antiinfeciosas

Alergia Alimentar

Fórmula semi-alimentar - 1980

- Alfaré
- Peptamen Júnior
- Pregomin

Resolução SS – 336, de 27-11-2007

- Crianças com LM: estimular a manutenção do aleitamento materno e orientar a dieta materna com restrição total de LV e derivados.

Crianças alimentadas com fórmula à base de LV ou alimentadas com LV integral:

- Cç 0-6m: fórmula extensamente hidrolisada
- Cç 6-12m: sem comprometimento intestinal = Ptn isolada soja; com comprometimento intestinal: fórmula extensamente hidrolisada.
- Cç > 12 e < 24 meses: sem compr. Intestinal e eutróficas = Ptn isolada soja + refeição sal; com compr. Intestinal e/ou subnutrida = fórmula extensamente hidrolisada.
- Cç > 24 meses = refeição sal, não recebendo fórmula específica.

The effects of elimination diet on nutritional status in subjects with atopic dermatitis

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Table 2. Intake of nutrients by the number of food allergens in subjects with food allergy

	1 (n = 45)	2 (n = 35)	Over 3 (n = 40)
Energy, kcal	1240.05 ± 364.59 [§] (77.50 ± 22.90)	1156.48 ± 386.92 [§] (75.82 ± 24.37)	1021.30 ± 428.61 [§] (62.14 ± 17.89)
Protein, g	49.37 ± 19.03 [§] (178.80 ± 77.98)	44.88 ± 18.78 [§] (167.45 ± 71.56)	38.08 ± 18.25 [§] (130.81 ± 57.01)
Lipid, g	32.06 ± 14.87 [§]	28.98 ± 15.03 [§]	21.42 ± 12.14 [§]
Carbohydrate, g	192.65 ± 52.22	178.59 ± 66.00	168.41 ± 68.23
CPF ratio	62:23:15	63:22:15	67:18:15
Dietary fiber, g	12.40 ± 5.26	12.23 ± 7.02	11.39 ± 6.50
Ca, mg	353.47 ± 177.97 (51.91 ± 21.50)	328.70 ± 195.73 (54.02 ± 35.52)	307.84 ± 190.55 (47.35 ± 27.06)
P, mg	684.06 ± 276.59 [§] (101.21 ± 32.78)	609.04 ± 233.88 [§] (98.93 ± 38.94)	535.58 ± 247.17 [§] (85.27 ± 35.19)
Fe, mg	8.78 ± 3.04 (98.83 ± 38.09)	7.99 ± 3.74 (88.34 ± 34.09)	7.36 ± 4.13 (80.28 ± 39.17)
Na, mg	2334.20 ± 1194.9	1898.18 ± 947.63	1837.39 ± 1281.30
K, mg	1781.37 ± 687.18	1636.39 ± 622.19	1490.09 ± 747.24
Zn, mg	6.49 ± 2.55 [§] (147.28 ± 51.25)	5.82 ± 2.32 [§] (137.69 ± 39.70)	4.91 ± 2.24 [§] (114.44 ± 39.86)
Vit A, ugRE	468.95 ± 285.04 (103.03 ± 65.75)	506.16 ± 446.10 (110.47 ± 82.68)	425.12 ± 322.45 (84.05 ± 54.25)
Vit B ₁ , mg	0.71 ± 0.23 [§] (95.00 ± 35.28)	0.67 ± 0.38 [§] (91.94 ± 44.05)	0.56 ± 0.26 [§] (72.19 ± 28.56)
Vit B ₂ , mg	0.73 ± 0.31 [§] (82.56 ± 42.23)	0.64 ± 0.28 [§] (75.40 ± 42.23)	0.54 ± 0.25 [§] (58.10 ± 25.21)
Vit B ₆ , mg	1.35 ± 0.48 (144.36 ± 59.42)	1.19 ± 0.48 (126.85 ± 42.43)	1.13 ± 0.55 (114.61 ± 47.64)
Niacin, mg	10.56 ± 5.00 [§] (106.89 ± 43.50)	9.18 ± 4.41 [§] (95.91 ± 41.04)	8.10 ± 3.90 [§] (81.91 ± 37.85)
Vit C, mg	70.09 ± 43.49 (117.75 ± 82.99)	74.16 ± 45.38 (128.99 ± 89.91)	60.03 ± 40.70 (96.61 ± 80.35)
Folic acid, µg	169.75 ± 109.07 (71.53 ± 54.67)	152.40 ± 118.42 (64.35 ± 45.36)	141.06 ± 81.98 (57.15 ± 38.49)
Vit E, mg	9.27 ± 4.13	9.00 ± 5.32	8.71 ± 6.67
Cholesterol, mg	236.44 ± 123.40 [§]	201.75 ± 121.53 [§]	137.48 ± 107.05 [§]

Energy () represents percent of estimated energy requirement, Nutrients () represents percent of recommended nutrient intake.

Data are expressed as mean ± SD.

[§] Values with the number of food allergens were significantly different by ANOVA coupled with Duncan multiple range tests at *P* < 0.05.

Table 3. Intake of nutrients between positive and negative milk and egg allergies in subjects with food allergy

	Milk		Egg	
	Negative (n = 77)	Positive (n = 43)	Negative (n = 79)	Positive (n = 41)
Energy, kcal	1184.96 ± 357.79 (72.24 ± 22.55)	1067.18 ± 463.26* (71.26 ± 23.31)	1190.06 ± 387.88 (75.35 ± 23.34)	1051.61 ± 414.52* (65.22 ± 20.14)
Protein, g	46.20 ± 17.91 (160.97 ± 69.22)	40.89 ± 20.97 (158.67 ± 74.25)	46.26 ± 19.26 (170.21 ± 74.68)	40.52 ± 18.58 (138.85 ± 63.01)
Lipid, g	29.49 ± 14.19	24.25 ± 15.11*	29.74 ± 14.82	26.53 ± 13.68
Carbohydrate, g	185.48 ± 59.21	171.50 ± 67.33	186.53 ± 58.45	168.81 ± 68.42
CPF ratio	62:15:22	66:15:19	63:15:22	65:15:20
Dietary fiber, g	12.52 ± 6.19	11.10 ± 6.15	12.37 ± 5.70	11.32 ± 7.06
Ca, mg	370.66 ± 189.77 (56.39 ± 29.17)	260.07 ± 160.49* (41.36 ± 22.78)	340.98 ± 180.56 (52.11 ± 27.26)	311.86 ± 199.41 (48.86 ± 29.33)
P, mg	648.04 ± 243.83 (98.15 ± 32.48)	549.38 ± 279.82 (89.98 ± 41.02)	641.60 ± 267.39 (98.80 ± 36.76)	556.97 ± 240.09 (88.34 ± 33.41)
Fe, mg	8.42 ± 3.48 (88.96 ± 35.58)	8.47 ± 3.92 (90.71 ± 42.05)	8.21 ± 3.42 (91.92 ± 37.35)	7.82 ± 4.10 (85.08 ± 38.89)
Na, mg	2189.12 ± 1136.51	1776.94 ± 1202.85*	2181.92 ± 1206.79	1770.70 ± 1066.08*
K, mg	1756.57 ± 664.55	1436.82 ± 709.26	1715.28 ± 688.79	1500.78 ± 694.00
Zn, mg	6.04 ± 2.21 (138.73 ± 43.44)	5.28 ± 2.81* (124.23 ± 50.14)	6.00 ± 2.49 (137.25 ± 48.26)	5.32 ± 2.36 (126.38 ± 41.82)
Vit A, ugRE	501.36 ± 357.92 (101.72 ± 67.54)	400.44 ± 327.41 (93.77 ± 69.58)	509.86 ± 374.75 (111.15 ± 72.70)	379.14 ± 278.56* (75.22 ± 51.14)
Vit B ₁ , mg	0.68 ± 0.30 (86.36 ± 35.02)	0.59 ± 0.28 (84.75 ± 41.35)	0.69 ± 0.31 (94.68 ± 39.34)	0.57 ± 0.26* (70.75 ± 26.85)
Vit B ₂ , mg	0.71 ± 0.29 (77.33 ± 41.63)	0.53 ± 0.26* (63.35 ± 30.81)	0.68 ± 0.30 (77.67 ± 41.21)	0.57 ± 0.26* (62.01 ± 30.80)
Vit B ₆ , mg	1.27 ± 0.48 (130.89 ± 52.17)	1.15 ± 0.56 (128.47 ± 52.52)	1.29 ± 0.50 (139.02 ± 55.23)	1.12 ± 0.52 (110.69 ± 40.17)
Niacin, mg	9.54 ± 4.47 (92.23 ± 38.64)	9.97 ± 4.77 (100.97 ± 47.31)	9.82 ± 4.87 (102.05 ± 44.02)	8.40 ± 3.80* (82.48 ± 34.68)
Vit C, mg	71.43 ± 45.21 (114.61 ± 87.29)	61.65 ± 39.01 (102.85 ± 80.33)	70.58 ± 40.77 (123.12 ± 87.56)	62.81 ± 47.60 (96.38 ± 76.32)
Folic acid, µg	161.90 ± 105.10 (63.79 ± 47.25)	142.99 ± 101.26 (60.17 ± 47.27)	160.45 ± 94.54 (69.47 ± 49.31)	144.86 ± 120.04 (55.33 ± 41.41)
Vit E, mg	9.48 ± 4.43	8.16 ± 6.76	9.59 ± 5.32	7.88 ± 5.41
Cholesterol, mg	206.00 ± 118.34	170.64 ± 131.92	221.83 ± 119.95	138.43 ± 113.99*

Energy () represents percent of estimated energy requirement, Nutrients () represents percent of recommended nutrient intake,

Data are expressed as mean ± SD,

* Significant difference between positive and negative food allergy according to independent t test,

Food allergy: Epidemiology, pathogenesis, diagnosis, and treatment

Scott H. Sicherer, MD, and Hugh A. Sampson, MD *New York, NY*

Dose, manner of preparation, and ancillary (eliciting) factors might alter reaction outcomes.

- Alcohol, NSAIDs, and exercise are among eliciting factors that might facilitate a reaction.
- Heating might alter allergenicity (eg, bakery products with egg/milk might be tolerated when whole forms are not and cooked fruits might be tolerated when raw fruits are not).
- A low dose might be tolerated while larger amounts are not.

- History should focus on amounts triggering a reaction and ancillary factors.
- History should explore the types of foods tolerated or not tolerated.

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Nutritional management and follow up of infants and children with food allergy: Italian Society of Pediatric Nutrition/Italian Society of Pediatric Allergy and Immunology Task Force Position Statement

Italian Journal of Pediatrics 2014, **40**:1 doi:10.1186/1824-7288-40-1

Nutritional assessment

The objectives of nutritional intervention in patients are: 1.prevent allergic reactions, 2.ensure adequate growth and development, 3.recognize and treat malnutrition.

The family pediatrician must be familiar with the eating habits of the allergic child, closely monitor the growth, be able to recognize when the nutritional assessment is necessary and direct the child to specialist allergy clinics staffed by a range of health professionals who specialize in allergy (e.g. allergists, nutritionists, dietitians, clinical psychologists) for a proper dietary intervention and an appropriate follow- up plan.

The assessment of the nutritional status of children with FA should follow a diagnostic pathway that involves a series of successive steps: detailed diet history, assessment of growth, recording of nutritional intake and nutritional parameters, nutritional intervention and an appropriate follow-up.

This Provisional PDF corresponds to the article as it appeared upon acceptance. Fully formatted PDF and full text (HTML) versions will be made available soon.

**Nutritional management and follow up of infants and children with food allergy:
Italian Society of Pediatric Nutrition/Italian Society of Pediatric Allergy and
Immunology Task Force Position Statement**

Italian Journal of Pediatrics 2014, **40**:1 doi:10.1186/1824-7288-40-1

Step 1. Obtaining a detailed diet history to identify dietary factors contributing to nutritional risk.

Keynote 1

The collection of a detailed diet history is essential for a proper evaluation. The information that must be obtained through a targeted diet history are summarized as follows:

- (a) Type of infant feeding
- (b) Age of solid food introduction and integration schedule of various solid foods

- (c) Details on the foods excluded and the reasons for exclusion
- (d) Type and quantity of water and drinks consumed
- (e) Use of special formulas and daily intake during the day
- (f) Intake of vitamin supplements and/or minerals, and dosage
- (g) Aversion of certain foods
- (h) Predilection of certain foods (from those permitted)
- (i) Configuration of a typical meal
- (j) Number of daily meals and distribution throughout the day

abstract

OBJECTIVES: To address questions regarding breastfeeding, complementary feeding, allergy development, and current infant-feeding recommendations.

METHODS: This was a nested, case-control within a cohort study in which mothers of 41 infants diagnosed with food allergy by the age of 2 years (according to double-blind, placebo-controlled food challenge) and their 82 age-matched controls kept prospective food diaries of how their infants were fed in the first year of life.

RESULTS: Infants who were diagnosed with food allergy by the time they were 2 years of age were introduced to solids earlier (≤ 16 weeks of age) and were less likely to be receiving breast milk when cow's milk protein was first introduced into their diet.

CONCLUSIONS: This study supports the current American Academy of Pediatrics' allergy prevention recommendations and the European Society of Pediatric Gastroenterology, Hepatology and Nutrition recommendations on complementary feeding to not introduce solids before 4 to 6 months of age. It also supports the American Academy of Pediatrics' breastfeeding recommendations that breastfeeding should continue while solids are introduced into the diet and that breastfeeding should continue for 1 year, or longer, as mutually desired by mother and infant. *Pediatrics* 2013;132:e1529–e1538

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