



Food hypersensitivities and atopic dermatitis in toddlers.

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Food allergy and atopic dermatitis



- **The association between atopic eczema and food allergy has long been recognized as a complex subject with contrasting perspectives among clinicians, patients and families.**¹
 - **Food induced eczema should be diagnosed only by a thorough diagnostic procedure, taking account the patient's history.**²
- 1. Worth A, Sheikh A. Food allergy and atopic eczema. Curr Opin Allergy Clin Immunol 2010;10:226-230.
 - 2. Werfel T, Breuer K. Rol of food allergy in atopic dermatitis. Curr Opin Allergy Clin Immunol 2004;4:379-365

- Food allergy predominantly affects children rather than adults with atopic dermatitis (AD).
- Early food sensitization has been found to be significantly associated with AD.



. Werfel T, Breuer K. Rol of food allergy in atopic dermatitis. Curr Opin Allergy Clin Immunol 2004;4:379-365

- **Clinical studies have been revealed than more than 50% of all children with atopic dermatitis can be exacerbated by certain foods reacting with a worsening of skin eczema alone or in addition to immediate symptoms.**

· Heratizadeh A, Wichmann K, Wefel T. Food allergy and Atopic Dermatitis: How are the connected?. Curr Allergy Asthma Rep (2011) 11:284-291

Prevalence:

Authors	year	Percentage
Sampson	85	56
Burks	88	33
Sampson	92	63
Eigenmann	98	37
Burks	98	39
Niggemann	99	51
Eigenmann y Calza	2000	34
Breuer	2004	46

Werfel T, ballmer-Weber, et al. Eczematous reactions to food in atopic eczema. Position paper of the EAACI and GA²LEN. Allergy 2007,62: 723-728.

Prevalence:

Age
Severity of AD*

	% of asociation	Patients number	Food challenge
Burks	35%	165 patients	
Eigenmann	37%		Yes
Guillet and Guillet		250 children	Yes*
Hill et al	55-66%	2184	No

Prevalence:

- ◉ Incidence from 3 to 35%
- ◉ Variation with food challenges 1-4%
- ◉ Troubles of diagnosis,
- ◉ low specificity with skin prick test reactives
- ◉ A need to cohorts studies

Mills C, Mackie R, et al The prevalence cost and basis of food allergy across Europe. Allergy 2007; 62:717-722.

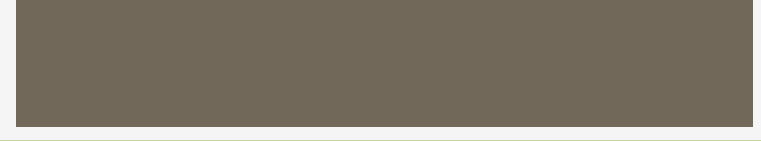
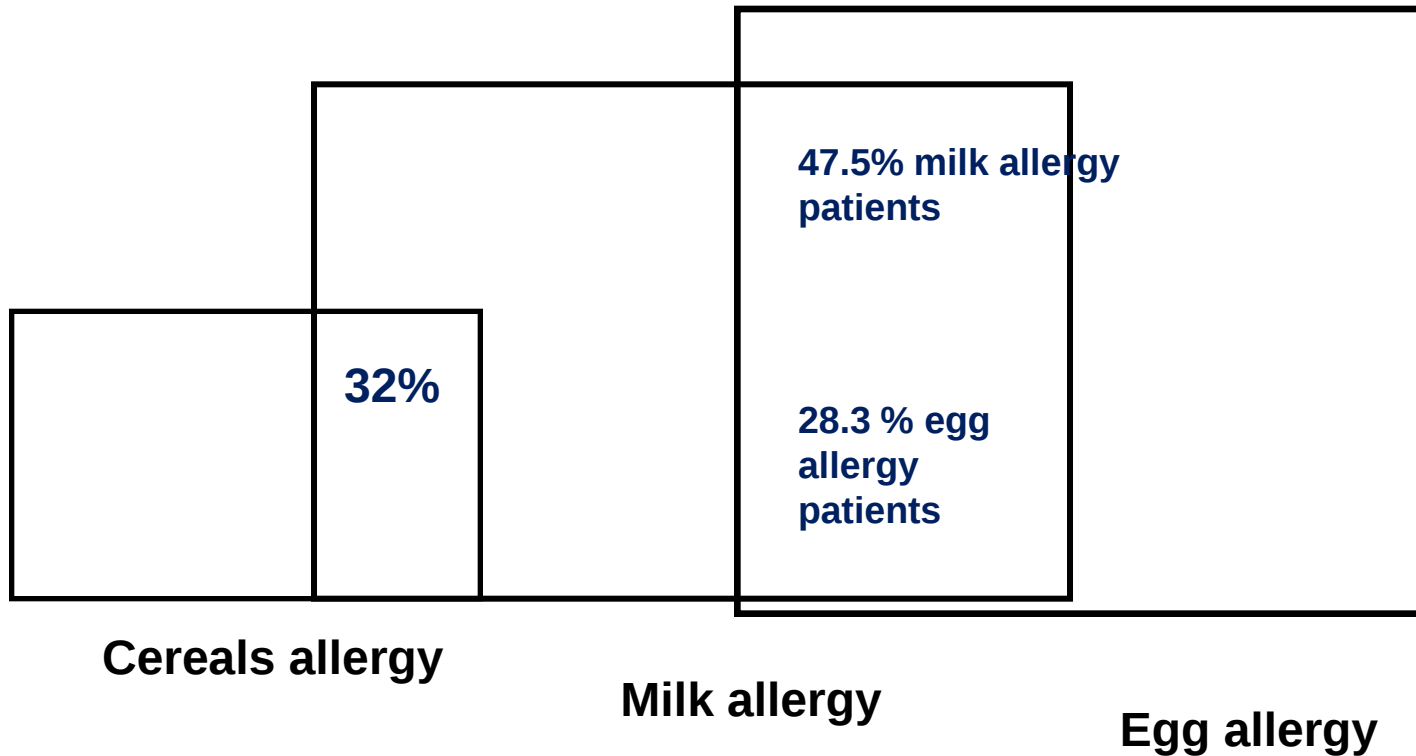


Table 1. Foods being used for serological analysis of food-specific IgE and skin testing in the EuroPrevall cohorts

Priority 1	Priority 2	Priority 3
Hen's egg	Kiwi	Sunflower
Cow's milk	Mustard	Buckwheat
Fish (cod)	Sesame	Banana
Shrimp	Soy	Carrot
Peanut	Walnut	Corn (maize)
Hazelnut	Wheat	Lentil
Apple		Melon
Peach		Poppy seed
Celery root (celeriac)		Tomato

Mills C, Mackie R, et al The prevalence cost and basis of food allergy across Europe. Allergy 2007; 62:717-722.

PREVALENCE



Alonso Lebrero E, Fernández Moya L. Alergia a alimentos en niños. *Alergol Immunol Clin* 2001; 16 (extraordinario 2):96-115.

COMMON FOODS

NIÑOS

Milk (2.5%)

Egg (1.3%)

Peanuts (0.8%)

Soy(0.4%)

wheat (0.4%)

Nuts (0.2%)

Fish (0.1%)



ADULTOS

Peanuts (0.6%)

Nuts (0.5%)

Fish (0.4%)

Mariscos (2.0%)



Sampson, Food Allergy, accurately identifying clinical reactivity. Allergy 2005; 60 (suppl 79):19-24

TYPE OF REACTION

**ATOPIC
DERMATITIS**

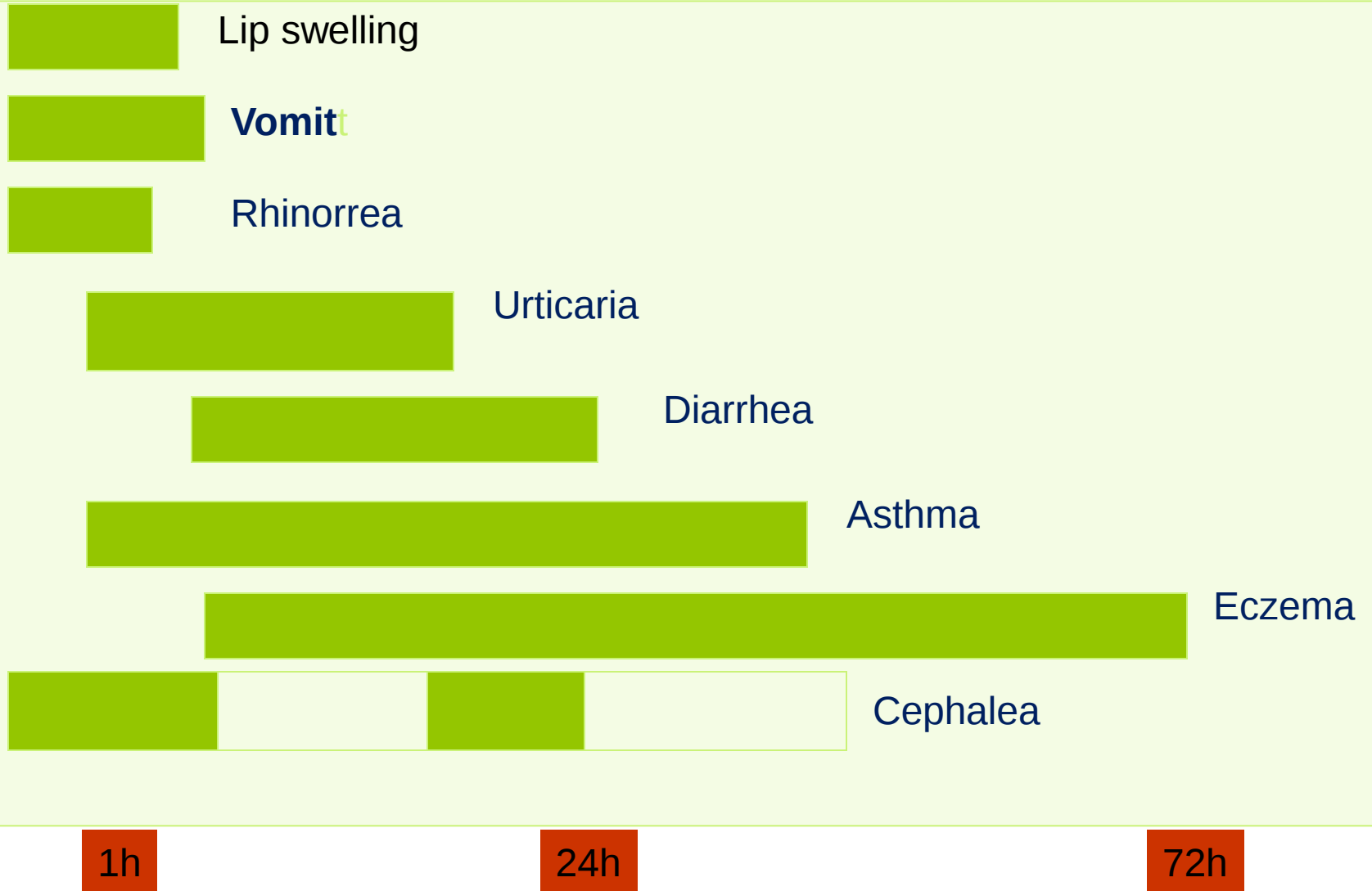
IGE MEDIATED

BOTH

NON IGE MEDIATED

Worth A, Sheikh A. Food allergy and atopic eczema. Curr Opin Allergy Clin Immunol 2010;10;226-230.

CLINICAL FEATURES



DIAGNOSIS

- Clinical History and evaluation
- Clinical and lab tests
- Diagnostic Avoiding diet
- Oral food challenge test

Butris J. Clinically Validated Diagnostic Tests and Non-validated Procedures of Unproven Value in Adverse Reactions to Foods. The Report of a British Nutrition Foundation Task Force. Blackwell Science 2002, Oxford. 131-137.

CLINICAL EVALUATION

SYMPTOMS

DIET BACKGROUND

ATOPY BACKGROUND

SIGN AND SYMPTOMS DIARY

CONCOMITANT MEDICATION

DIAGNOSTIC TOOLS

- **PRICK TEST:**

Commercial foods extracts

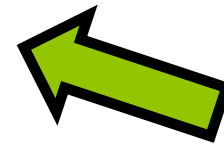
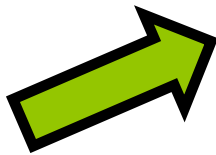
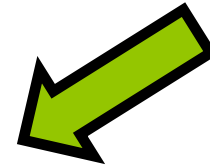
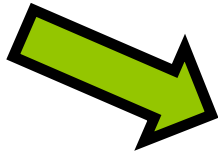
Fresh foods

Diagnostics tools



PRICK TESTS

DIAGNOSTICS TOOLS



PRICK BY PRICK

DIAGNOSTICS

Skin prick test:

Table 2. Diagnostic decision points for skin prick test wheal diameter in different study populations

Study population	Age (years)	Number of challenges	Allergen	Skin prick test cut-off wheal diameter (mm)	Predicted probability for positive reaction (%)	Reference
Australian	≤ 16	339	Cow's milk	8	100*	(30, 45)
		121	Hen's egg	7	100*	
		95	Peanut	8	100*	
Australian	≤ 2	27	Cow's milk	6	100*	(30, 45)
		30	Hen's egg	5	100*	
		33	Peanut	4	100*	
Spanish	≤ 2	81	Hen's egg	3	91†	(11)
French	≤ 16	363	Peanut	16	100‡	(44)
German	≤ 16	165	Cow's milk	12.5	95	(5)
		165	Cow's milk	17.3	99	
		118	Hen's egg	13.0	95	
		118	Hen's egg	17.8	99	

*Specificity.

†Efficiency.

‡Positive predictive value.

§Verstege A, Mehl A, Rolinck-Werninghaus C, Nown M, Beger H, Niggemann B (manuscript submitted).

Niggeman B, Rolinck-Werninghaus C, Mehl A, Binder C, Ziegert M, Beyer K. Controlled oral food challenges in children-when indicated, when superfluous? *Allergy* 2005;60:865-870

Study population	Years (años)	No Children	Foods	Skin prick test cut off point	Specificity
Australia	≤16 años	339 121 95	Leche Huevo cacahuete	8 mm 7mm 8mm	100 100 100
Australia	≤2 años	27 30 33	Leche Huevo cacahuete	6 mm 5 mm 4mm	100 100 100
Spain	≤2 años	81	huevo	3 mm	91
France	≤ 16 años	363	cacahuete	16 mm	100
Germany	≤ 16 años	165 165 118 118	Leche Leche Huevo huevo	12.5 mm 17.3 mm 13 mm 17.8 mm	95 99 95 99
Mexico	≤ 12 años	235 215 235 182 98	Leche Huevo Trigo soya atun	3 mm 4 mm 3 mm 3 mm 3 mm	96.4 100 50 90.1 82.6
US (sampson, eigemann)	????	40 35 18 21 25	Leche Huevo Cacahuete Trigo soya	5mm 4mm 6mm 3mm 3mm	78 85 89 60 55

Niggeman B, Rolinck-Werninghaus C, Mehl A, Binder C, Ziegler M, Beyer K. Controlled oral food challenges in children-when indicated, when superfluous? Allergy 2005;60:865-870

Country	Age	food	Nivel (KU/L)	VPP (%)
US	≤14	milk egg peanut	15 7 14	95 95 95
Germany	≤16	milk egg	-- 13	95 95
Germny	≤1	milk egg Egg	-- 11 89	95 95 99
Spain	≤1	Milk	5	95
Spain	≤2	egg	0.35	88
France	≤16	peaunt	57	100
Korea	4-14	wheat	0.35	100
Mexico	≤12	milk egg wheat Soy tuna	12 0.73 0.35 0.35 8	86.9 95 70 73 38.3

Niggeman B, Rolinck-Werninghaus C, Mehl A, Binder C, Ziegert M, Beyer K. Controlled oral food challenges in children-when indicated, when superfluous? Allergy 2005;60:865-870

DIAGNOSTICS

Table 1. Diagnostic decision points with a 90–100% predicted probability of clinical reactivity

Study population	Age (years)	Number of challenges	Allergen	Specific IgE cut-off level (kU/l)	Predicted probability for positive reaction (%)	Reference
US	≤ 14	Total of 196	Cow's milk	32	95	(12)
			Hen's egg	6	95	
			Peanut	15	95	
US	≤ 14	62	Cow's milk	15	95	(21)
		75	Hen's egg	7	95	
		68	Peanut	14	95	
German	≤ 16	398	Cow's milk	*	95	(23)
		398	Cow's milk	*	99	
		227	Hen's egg	13	95	
		227		59	99	
German	≤ 1	186	Cow's milk	*	95	(23)
		186	Cow's milk	*	99	
		41	Hen's egg	11	95	
		41	Hen's egg	89	99	
Spanish	≤ 1	170	Cow's milk	5	95†	(22)
Spanish	≤ 2	81	Hen's egg	0.35	88†	(11)
French	≤ 16	363	Peanut	57	100‡	(44)
Korean	4–14	44	Buckwheat	0.35	100‡	(25)

*Calculations did not yield 95% predictive values.

†Efficiency.

‡Positive predictive value.

Niggeman B, Rolinck-Werninghaus C, Mehtl A, Binder C, Ziegert M, Beyer K. Controlled oral food challenges in children-when indicated, when superfluous? *Allergy* 2005;60:865-870

Corn allergy

(70%) wheezing,
(39%) atopic dermatitis
(24%) diarrhea,
(19.5%) urticaria

cut off point	specificity	sensitivity	NPV	PPV
7.5	77	96	80	76

Estrada-Reyes, et al. Do Specific Immunoglobulin E Levels Have any Role in the Diagnostic of Corn Allergy in Children? Fish Consumption and Health 2009 Nova Science Publishers, Inc NY

The APT with foods (cow's milk, hen's egg, cereals and peanut) may increase the identification of food allergy in patients with AE in the following cases (12, 25):

1. Suspicion of food allergy without predictive specific IgE levels or positive SPT
2. Severe and/or persistent AE with unknown trigger factors
3. Multiple IgE sensitizations without proven clinical relevance in patients with AE.

Position paper

Allergy 2007; 62: 723–728
Eczematous reactions to food in atopic eczema: position paper
of the EAACI and GA²LEN

DIAGNOSTICS

(Atopy patch test):

Epicutaneous application of intact protein allergens on a device.

It has become a potentially valuable in the diagnosis of food hypersensitivity in patients with atopic dermatitis and gastrointestinal symptoms

Beyer S, Teuber S. Food allergy diagnostics. Curr Opin in Allergy and Clinical Immunology 2005, 5:261-266.

Atopy patch test diagnostic value.

- 130 DA children.

food	Sensitivity	Specificity	PPV	NPV.
milk	64%	86%	47%	93%
egg	86%	73%	22%	985
wheat	100%	100%	40%	100%

Tesse, et al. The diagnostic value of atopy patch test (APT) with regard to late-phase clinical reactions to food in children with atopic dermatitis. JACI Feb 2004, 113 (2)l. s297.

Atopy patch test

To apply



reading 72 HRS



Atopy patch test score

1	Moderate erythema plus papules (seven or more)
2	Induration (any) plus papules (seven or more)
3	Moderate erythema plus induration (any) plus papules (seven or more)
4	Vesiculation

Heine GR, Verstege A, Mehl A, Staden U. Proposal for a standardized interpretation of the atopy patch test in children with atopic dermatitis and suspected food allergy. *Pediatr Allergy Immunol* 2006;17:213-217.

Table 3. Results of the ROC analysis for patch test score to milk, egg, soy, wheat.

	Cut-off value (score)	PPV (%)	NPV (%)	Sensitivity (%)	Specificity (%)
Milk	2	100	42	54	100
Egg	1	98.4	54.2	59.2	92.9
Soy	2	96.7	86.1	71.0	98.6
Wheat	2	88.4	93.2	62.1	98.4

PPV: positive predictive value; NPV: negative predictive value

Estrada-Reyes E, Nava-Ocampo A. Allergy 2007;62;s83. 55.

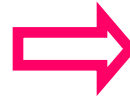
FOOD CHALLENGE

- **Only way to establish or discard an adverse reaction to food in children or adults.**
- There is a need to standardized the procedure.
- Allowing a comparison between results in different centres and population in a scientific assays.

Bindselev-Jensen C, Ballmer-Weber B, et al Standardization of food challenges in patients with immediate reactions to foods – position paper from the European Academy of Allergy and Clinical Immunology. Allergy 2004;59:690-697.

DIET ANALYSIS

FOOD DIARY
ELIMINATION DIET



2 + 2 WEEKS

FOOD CHALLENGE



OPEN CHALLENGE



ORAL FOOD CHALLENGE



SIMPLE-BLIND CHALLENGE



DOUBLE-BLIND CHALLENGE

EVALUATION

- Food challenge gold standard to evaluate a patient
- **SCORAD increase 10 points or more**
- **MONERET VAUTRIN score**
- Urticaria
- Rhinitis
- Wheezing
- Abdominal pain
- Vomit
- Diarrhea
- Angioedema
- Headache

Evaluación

- Moneret-Vautrin. score 1-5.
- 1. lip swelling
- 2. Erythema under the lip.
- 3. Contiguous urticaria of the cheek,
- 4. Edema of the cheek associated + rhinitis + conjunctival injection
- 5. systemic reaction associated with pruritus of the eczema and cough.
- Positivity criteria are evaluated if there was presence of systemic manifestations, respiratory, skin or digestive (vomiting or diarrhea)

**Moneret-Vautrin DA, Rance F, Kanny G, Olsewski A, Gueant LJ, Dutau G, Guerin L.
Food allergy to peanuts in France-evaluation of 142 observations. Clin Exp
Allergy 1998;28: 1113-1119.**

- Food challenge dosage

Food	Dosage
peanut	0.1mg
milk	0.1ml
egg	1mg
fish	5mg
wheat	100mg
soy	1mg
Shrimp	5mg
nut	0.1mg

EAACI position paper. Allergy 2004;59:690-697.



DIAGNOSIS

Double blind-placebo control food challenge test:

- Gold-standard.
- Food selection will perform according to clinic history and lab test previously
- Avoid unnecessary diets and malnourished

Beyer S, Teuber S. Food allergy diagnostics. Curr Opin in Allergy and Clinical Immunology 2005, 5:261-266.

SCORAD, EUROPEAN TASK FORCE ON ATOPIC DERMATITIS

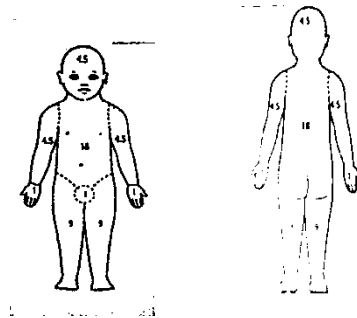
Nombre:

Registro:

Fecha:

No. Paciente

No. SCORAD:



A. EXTENSION

B. INTENSIDAD

CRITERIO	INTENSIDAD
Eritema/Oscurecimiento	
Edema/Pápulas	
Lloroso/Costras	
Excoriaciones	
Liquenificación/Prurigo	
Sequedad de la piel en áreas no involucradas	

Promedio del área representativa

0 Ausente

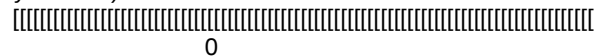
1 Leve

2 Moderado

3 Severo

Escala análoga visual (promedio de los 3 últimos días y noches)

PRURITO (0 a 10)



SUEÑO ALTERADO



**SCORAD objetivo: A/7+7B/2

/83

SCORAD A/5+7B/2+C

/103

C: Síntomas subjetivos: Prurito + sueño alterado:

LEVE < 15

MODERADA 15-40

SEVERA > de 40

Avoiding diet.

◉ How long time?

- ◉ Skin prick test - Specific IgE- Food challenge
- ◉ Elimination diet
- ◉ Specific IgE-skin prick test
- ◉ Food challenge
- ◉ Nutritionits. To keep adequet nutrtrional value.

TOLERANCE mexican patients

- 150 patients.

	Visit 1	Visit 2
Milk	82%	92%
Egg	72.7%	88.7%
Soy	95.4%	98.7%
Corn	98.7%	99.3%
wheat	98%	99.4%

Estrada-Reyes E, Rodriguez-Ventura A. Allergy 2010;65 s92:727

Nutrition Facts

Serv. Size 1 tbsp (15mL)

Servings about 20

Calories 10

Fat Cal. 0

*Percent Daily Values (%DV) are based on a 2,000 calorie diet.

Amount/Serving	%DV*	Amount/Serving	%DV*
Total Fat 0g	0%	Total Carb. 1g	0%
Sat. Fat 0g	0%	Fiber 0g	0%
Cholest. 0mg	0%	Sugars 1g	
Sodium 1260mg	53%	Protein 1g	

Not a significant source of vitamin A, vitamin C, calcium and iron.

INGREDIENTS: WATER, SALT, HYDROLYZED SOY PROTEIN, CORN SYRUP, CARAMEL COLOR, POTASSIUM SORBATE (PRESERVATIVE).

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Nutrition Facts

Serv. Size 1 tbsp (15 mL)

Servings about 30

Calories 10

Fat Cal. 0

*Percent Daily Values (%DV) are based on a 2,000 calorie diet.

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