

# Allergy to pizza: an uncommon and multifaceted allergy

A. CANTANI

Department of Pediatrics, Allergy and Clinical Immunology Division,  
University of Rome "La Sapienza" - Rome (Italy)

**Abstract.** – The involvement of the Italian “pizza” in the wide and variegated field of food allergy is certainly uncommon. This simple Italian dish consists of a breadlike crust covered by a spiced preparation of cheese and tomatoes and baked. Italian pizza found its origin in Napoli and only in recent years has become a very popular food in the rest of Italy and elsewhere. In the beginning, it was the food of the poor, but was made with natural foods, but nowadays has been enriched by a number of ingredients and flavourings, thus multiplying the risk of allergic reactions.

**Key Words:**

Pizza, Cow milk, Anchovy, Cheese, Parsley, Soy, Allergic reactions, Anaphylaxis.

## Comment

Italian “pizza” is presently also a generic name that can mean everything and nothing<sup>1</sup>: the Neapolitan one ignores for example the mushrooms, that may be popular in Genova, and includes anchovies, tomato and tomato sauce, cheese, flour, yeast, as well as several other ingredients. A recent report<sup>1</sup> has described the case of a 32-year-old woman reporting more than 10 acute systemic reactions in the last 2 years, including generalized urticaria, facial angioedema, laryngeal edema, and anaphylaxis. These reactions were apparently due to the soybean flour contained in pizza. However I do not understand why the authors have not taken in any consideration the “cheese”, normally cut slices of “mozzarella”, which is typically made of

cow’s milk (CM). CM is so a potent allergen to trigger allergic reactions in 24.9% of children<sup>2</sup>, including anaphylaxis (10% of cases) urticaria-angioedema (18%), bronchospasm (21%), rhinitis (20%), colics (27%), vomiting (48%), and diarrhea (53%)<sup>3</sup>. Anaphylaxis also occurs when two drops are put on the lower lip of infants at risk of atopy during an open food challenge (OFC)<sup>3</sup>. It is therefore my suggestion that it is more probable that the reactions reported in a young lady<sup>1</sup> were due to CM.

There is also “fish”<sup>1</sup> and generally are found the anchovies: however, in a group of atopic and nonatopic fish-tolerant controls, 20/26 (77%) reacted by skin prick tests (SPT) to one or more fish extracts tested; the most prevalent positive reaction was to anchovy (73%)<sup>2</sup>.

Another intriguing issue is the high CAP result for parsley (8.65)<sup>1</sup>, which can be added to some pizza versions, I do not know whether this also happens elsewhere. Parsley has provoked anaphylaxis, angioedema and urticaria<sup>4</sup>, and crossreacts with celery<sup>5</sup>, an important allergen.

Soy is not a potent allergen as CM: I have meta-analyzed 17 different studies concluding that in SPT-RAST-OFC/double-blind food challenge (DBFC)-based epidemiological studies soy allergy attains an incidence of 3%, and in OFC-DBPCFC (double-blind placebo-controlled food challenge) studies of 3.5%<sup>6</sup>, as it is evident from Table 1<sup>7-14</sup>. These data are reinforced by a recent DBPCFC study in 92 children aged 1.5 years (mean) with gastrointestinal allergy to CM: no child resulted positive to soy<sup>15</sup>. In conclusion, soy has provoked a clinical case of anaphylaxis every 22,3 years<sup>6</sup>.

Table I. Results of studies employing challenge tests to soy.

Author(s)	Ref	No. of subjects	Age (years)	Challenge type	Reactions (%)
Sampson et al	7	204	5.2 (M)	DBPCFC	5
Bock et al	8	313	< 3-19	DBPCFC	5.4
Bock et al	9	710	NS	DBPCFC	6
Giampiero et al	10	317	0.4 (M)	OFC	2.5
Kivity et al	11	52	18 (M)	DBFC	0
Magnolfi	12	900	0.1-18	DBPCFC	6.1
Eigenmann et al	13	63	2.3 (M)	DBPCFC, OFC	0
Burks et al	14	98	0.3-21.9	DBPCFC	3.1
Total	2657				Mean = 3.5

Abbreviations: M = median, NS = Not specified.

### References

- 1) SENNA GE, CRIVELLARO M, BONADONNA P, DAMA P, MEZZELANI P, PASSALACQUA G. Pizza, an unsuspected source of soybean allergen exposure. *Allergy* 1998; 53: 1106-1107.
- 2) HELBLING A, McCANTS ML, MUSMAND JJ, SCHWARTZ HJ, LEHRER SB. Immunopathogenesis of fish allergy: identification of fish-allergic adults by skin test and radioallergosorbent test. *Ann Allergy Asthma Immunol* 1996; 77: 48-54.
- 3) CANTANI A, GAGLIESI D. Severe reactions to cow's milk in very young infants at risk of atopy. *Allergy Asthma Proc* 1996; 17: 205-208.
- 4) KAUPPINEN K, KOUSA M, REUNALA T. Aromatic plants a cause of severe attack of angioedema and urticaria. *Contact Derm* 1980; 6: 251-254.
- 5) STAGER J, WÜTHRICH B. Association de l'allergie au celeri: l'allergie aux pices. *Rev Fr Allergol* 1987; 27: 137-141.
- 6) CANTANI A, LUCENTI P. Natural history of soy antigenicity and or allergenicity in children, and the clinical use of soy-protein formulas. *Pediatr Allergy Immunol* 1997; 8: 59-64.
- 7) SAMPSON HA. The role of food hypersensitivity and mediator release in atopic dermatitis. *J Allergy Clin Immunol* 1988; 81: 635-645.
- 8) BOCK SA. Food challenges in the diagnosis of food hypersensitivity. *Nestlé Nutr Workshop Ser* 1996; 34: 105-117.
- 9) BOCK SA, SAMPSON HA, ATKINS FM et al. Double-blind, placebo-controlled food challenge (DBPCFC) as an office procedure: a manual. *J Allergy Clin Immunol* 1988; 82: 986-997.
- 10) GIAMPIERO PG, RAGNO V, DANIELE S, CANTANI A, FERRARA M, BUSINCO L. Soy hypersensitivity in children with food allergy. *Ann Allergy* 1992; 69: 143-146.
- 11) KIVITY S, DUNNER K, MARIAN Y. The pattern of food hypersensitivity in patients with onset after 10 years of age. *Clin Exp Allergy* 1994; 24: 19-22.
- 12) MAGNOLFI C, ZANI G, LACAVA L, PATRIA MF, BARDARE M. Soy allergy in atopic children. *Ann Allergy Asthma Immunol* 1996; 77: 197-201.
- 13) EIGENMANN PA, SICHERER SH, BORKOWSKI TA, COHEN BA, SAMPSON HA. Prevalence of IgE-mediated food allergy among children with atopic dermatitis. *Pediatrics* 1998; 101: E8.
- 14) BURKS AW, JAMES JM, HEGEL A, et al. Atopic dermatitis and food hypersensitivity reaction. *J Pediatr* 1998; 132: 132-136.
- 15) SAMPSON HA, ZEIGER RS, BOCK SA, BURKS AW. Prevalence of soy allergy in young children with cow milk allergy. *J Allergy Clin Immunol* 1997; 99: S491.