

Milk, the Most Commonly Undeclared Food Allergen Causing Unexpected Allergic Reactions in Sweden 2004-2011

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Background

Allergy to milk proteins is a common allergic manifestation, especially among children. Different types of food products could be a risk factor for milk allergic individuals. According to the European Community Directive 2000/13/EC the list of ingredients shall include all the ingredients of the foodstuff, however with some exceptions. In 2003 Directive 2003/89/EC entered into force stating that milk and other ingredients, which are common elicitors of food allergic reactions, shall always be declared in the labeling.

Objective

To investigate which undeclared food allergen that most commonly has caused unexpected allergic reactions in Sweden between 2004 and 2011, i.e. since 2003/89/EC entered into force, and to compile data regarding the reactions to this food allergen.

Conclusions

Although rare, allergic reactions to undeclared food allergens may occur. Milk was the most commonly undeclared food allergen causing allergic reactions in Sweden between 2004-2011.

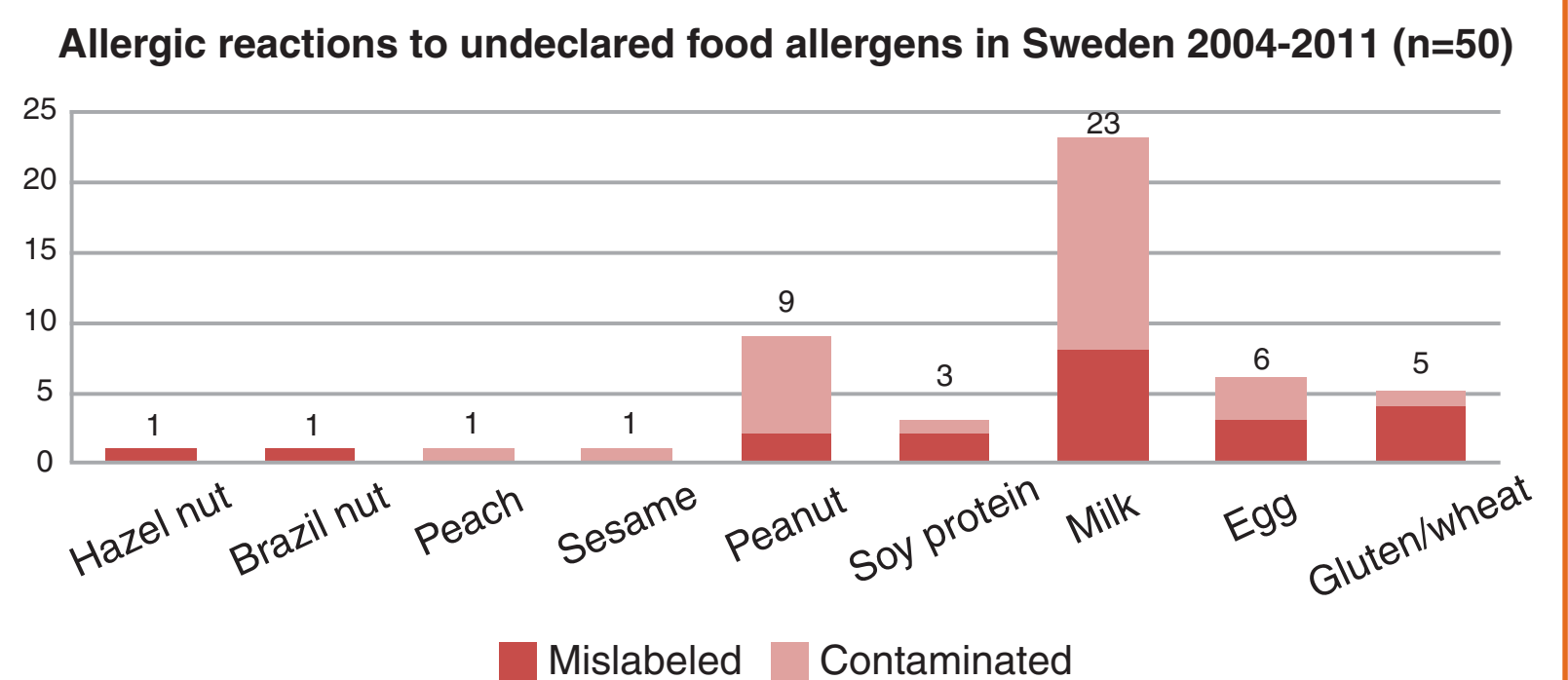


Methods

The medical care, school personnel and control authorities have since 1990 been encouraged to report allergic reactions to foods, which do not declare the ingredient causing the allergic reaction, to the Swedish National Food Agency. Also, the suspected foods have been provided for analyses. Food allergens, e.g. caseins (a group of milk proteins), were analyzed with Enzyme Linked Immunosorbent Assay (ELISA) and/or Rocket Immuno-electrophoresis (RIE). The quantification limits of the casein ELISA and the casein RIE are 0.5 mg casein/kg and 10 mg casein/kg, respectively. The measurement uncertainties are 30 % and 40 % for the casein ELISA and the casein RIE, respectively.

Results

Figure 1. The figure shows number of allergic reactions to undeclared food allergens in Sweden between 2004-2011. The different colors of the piles indicate whether the causing food was contaminated or mislabeled.



The persons who suffered from unexpected allergic reactions to milk were all children or teenagers (table 1). The symptoms of the reactions varied from itchy mouth and stomach pain to anaphylactic reactions (n = 5). One death was most likely caused by an allergic reaction to bread contaminated with milk. The lowest doses eliciting allergic reactions were calculated to be 2 to 9 mg casein. The types of foods causing the reactions were chocolate, meat products, ready-made meals, sauces, bread and a soy-based "yoghurt". The unexpected allergic reactions to milk were caused by mislabeling in 8 cases and to contamination in 15 cases (figure 1).

Table 1. Descriptions of the 23 allergic reactions caused by undeclared milk in foods between 2004-2011. All persons had previously been diagnosed with allergy to cow's milk.

Sex/Age (year)	Symptoms	Type of food	Casein mg/kg	Amount consumed*	Dose* mg casein
M/12	Stomach pain, urticaria, itchy mouth and throat	Chocolate	3200	40 g*	128*
M/12	Allergic reaction	Chocolate	780	40 g*	31*
F/9	Anaphylactic reaction	Chocolate pastry	1200	20 g*	24*
M	Urticaria, itchy mouth	Chocolate pastry	1000	20 g*	20*
F/13	Stomach pain, asthma, itchy mouth	Chocolate pastry	287	20 g*	6*
M	Severe allergic reaction	Chocolate pastry	800	82 g	66
F/5	Itchy throat	Chocolate rice cookies	3000	30 g*	90*
M	Allergic reaction	Sausage	19	100 g	2
M/4	Stomach pain, itchy mouth and throat	Meat balls	887	20	18
M/8	Allergic reaction	Hamburger	286	100 g*	29*
M	Allergic reaction	Hamburger	900 mg casein/kg**	100 g*	90*
M/9	Asthma, swollen face	Liver pâté	858	10 g	9
Two children	Allergic reaction	Sausage casserole	55	150 g*	8*
M/2	Anaphylactic reaction	Lasagna	7200	50*	360*
M/14	Asthma, itchy mouth	Lasagna	7500	200 g*	1500*
F/8	Urticaria, itchy and swollen throat	Meat gratin	87	60 g	5
M/4	Stomach pain, swollen throat	Fish soup	1006	100 g*	101*
Two children	Allergic reaction	Sauce	335	40 g*	13*
F	Stomach pain, urticaria, nausea	Sauce powder	553	10 g*	6*
F/19	Urticaria, itchy mouth and swollen lips	Sauce powder	8897	10 g*	89*
F/15	Anaphylactic reaction	Coleslaw	2244	100 g*	224*
M/19	Fatal anaphylaxis	Bread	23	200 g*	5*
F/19	Anaphylactic reaction	Soy-based "yoghurt"	107	15 g	2

*The amount of the consumed food was estimated and thus the dose is an estimated value.

**The boy was also allergic to egg and the hamburger contained 600 mg ovalbumin/kg in addition to casein.

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