

Detection of Egg Proteins in Food Matrices (2011-2021)

Authors : Daniela Manila Bianchi, Samantha Lupi, Elisa Barcucci, Sandra Fragassi, Clara Tramuta, Lucia Decastelli

Abstract : Introduction: The undeclared allergens detection in food products plays a fundamental role in the safety of the allergic consumer. The protection of allergic consumers is guaranteed, in Europe, by Regulation (EU) No 1169/2011 of the European Parliament, which governs the consumer's right to information and identifies 14 food allergens to be mandatorily indicated on food labels: among these, an egg is included. An egg can be present as an ingredient or as contamination in raw and cooked products. The main allergen egg proteins are ovomucoid, ovalbumin, lysozyme, and ovotransferrin. This study presents the results of a survey conducted in Northern Italy aimed at detecting the presence of undeclared egg proteins in food matrices in the latest ten years (2011-2021). Method: In the period January 2011 - October 2021, a total of 1205 different types of food matrices (ready-to-eat, meats, and meat products, bakery and pastry products, baby foods, food supplements, pasta, fish and fish products, preparations for soups and broths) were delivered to Food Control Laboratory of Istituto Zooprofilattico Sperimentale of Piemonte Liguria and Valle d'Aosta to be analyzed as official samples in the frame of Regional Monitoring Plan of Food Safety or in the contest of food poisoning. The laboratory is ISO 17025 accredited, and since 2019, it has represented the National Reference Centre for the detection in foods of substances causing food allergies or intolerances (CreNaRiA). All samples were stored in the laboratory according to food business operator instructions and analyzed within the expiry date for the detection of undeclared egg proteins. Analyses were performed with RIDASCREEN®FAST Ei/Egg (R-Biopharm ® Italia srl) kit: the method was internally validated and accredited with a Limit of Detection (LOD) equal to 2 ppm (mg/Kg). It is a sandwich enzyme immunoassay for the quantitative analysis of whole egg powder in foods. Results: The results obtained through this study showed that egg proteins were found in 2% (n. 28) of food matrices, including meats and meat products (n. 16), fish and fish products (n. 4), bakery and pastry products (n. 4), pasta (n. 2), preparations for soups and broths (n.1) and ready-to-eat (n. 1). In particular, in 2011 egg proteins were detected in 5% of samples, in 2012 in 4%, in 2013, 2016 and 2018 in 2%, in 2014, 2015 and 2019 in 3%. No egg protein traces were detected in 2017, 2020, and 2021. Discussion: Food allergies occur in the Western World in 2% of adults and up to 8% of children. Allergy to eggs is one of the most common food allergies in the pediatrics context. The percentage of positivity obtained from this study is, however, low. The trend over the ten years has been slightly variable, with comparable data.

Keywords : allergens, food, egg proteins, immunoassay

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