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Published in *Journal of Allergy and Clinical Immunology* 97:1, part 3 (January 1996), p. 329 (no. 586);
doi: 10.1016/S0091-6749(96)80804-9

Published online August 7, 2006.

A Sandwich Enzyme-Linked Immunosorbent Assay (ELISA) for the Quantitation of Peanut in Foods

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Peanuts are one of the most allergenic foods known. Strict avoidance of peanut by peanut-allergic individuals is difficult and often unsuccessful. Peanut proteins have previously been found in nonpeanut foodstuffs prepared on shared processing equipment, and such carryover contamination increases the risk of occurrence of allergic reactions. Immunoassays offer a specific, sensitive, and rapid technique to detect and quantitate small amounts of proteins in food systems.

A sandwich-type, enzyme-linked immunosorbent assay (ELISA) was developed for the detection of peanut protein in foods. Selected food samples were ground and extracts prepared by overnight extraction in 0.01 M phosphate buffered saline, followed by centrifugation before analysis. Rabbit polyclonal antibodies elicited against an oil-roasted peanut extract were used as the capture antibody. The food sample extracts were then added, along with a standard extract of peanut. Goat polyclonal antibodies directed against dry-roasted peanuts were employed as detector antibodies, and the amount bound was ultimately determined using rabbit antigoat IgG conjugated to alkaline phosphatase, with subsequent substrate reaction.

The ELISA described has a detection limit of approximately 2 ppm of peanut, and succeeded in detecting peanut in foods that did not have peanut in the ingredient listing.