

Comparison of Laboratory-Developed and Commercial Monoclonal Antibody-Based Sandwich Enzyme-Linked Immunosorbent Assays for Almond (*Prunus dulcis*) Detection and Quantification.

Liu, C 2017

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Abstract:

A commercially available monoclonal antibody (mAb)-based direct sandwich enzyme-linked immunosorbent assay (ELISA) kit (BioFront Technologies, Tallahassee, Fla., U.S.A.) was compared with an in-house developed mAb 4C10-based ELISA for almond detection. The assays were comparable in sensitivity (limit of detection < 1 ppm full fat almond, limit of quantification < 5 ppm full fat almond), specificity (no cross-reactivity with 156 tested foods at a concentration of 100000 ppm whole sample), and reproducibility (intra- and interassay variability < 15% CV). The target antigens were stable and detectable in whole almond seeds subjected to autoclaving, blanching, frying, microwaving, and dry roasting. The almond recovery ranges for spiked food matrices were 84.3% to 124.6% for 4C10 ELISA and 81.2% to 127.4% for MonoTrace ELISA. The almond recovery ranges for commercial and laboratory prepared foods with declared/known almond amount were 30.9% to 161.2% for 4C10 ELISA and 38.1% to 207.6% for MonoTrace ELISA. Neither assay registered any false-positive or negative results among the tested commercial and laboratory prepared samples.