Improvements in methods to detect wheat in heat-processed foods by real-time PCR

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Identification and detection of trace amounts of food allergens in processed foods are highly important for food safety. Currently, processed food samples are frequently found to be negative for wheat allergens by a confirmatory PCR-based test even when the ELISA screening test strongly indicates possible wheat contamination (10 mg/kg or more of wheat protein). In this study, a real-time PCR (qPCR) method with a primer pair designed based on the sequence amplified in the official notification PCR method, using TaqMan- MGB probes, was developed to improve the sensitivity of the PCR-based confirmatory test for wheat allergens. The present qPCR method showed higher sensitivity to a plasmid containing the target DNA, DNA extracted from wheat, and heat-treated model samples containing wheat flour than the official notification method. Two heat-processed real specimens that tested positive by ELISA but negative by the conventional confirmatory PCR method were determined to be positive by the present qPCR method. The qPCR method designed here was found to be useful to detect wheat allergens in heat-processed foods.