Evaluasi DNA untuk Mendeteksi Produk Olahan Daging yang Diduga Mengandung Bahan yang Bersumber dari Babi dengan Metode Taqman Real Time PCR = DNA Evaluation to Detect Processed Meat Products Suspected of Containing Ingredients Sourced from Pork Using the Taqman qPCR Method

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Abstrak

Metode Taqman MGB real time PCR yang cepat merupakan kunci pengawasan pemalsuan daging yang efektif. Penelitian bertujuan mengevaluasi kuantitas, kualitas DNA produk olahan daging babi, serta kandungan DNA babi produk olahan daging sapi yang diduga mengandung babi menggunakan Taqman MGB real time PCR untuk memverifikasi label. Lima produk olahan daging babi, 30 produk olahan daging sapi: dendeng, abon, baso, dan daging asap sebagai sampel, serta daging babi segar sebagai kontrol positif diekstraksi, diukur konsentrasi, kemurnian DNA, dielektroforesis serta diamplifikasi dengan realtime PCR. Konsentrasi, kemurnian DNA, nilai Ct sampel diuji ANAVA satu arah dilanjutkan uji Tukey, kecuali nilai Ct produk olahan daging sapi. Integritas DNA genomnya dianalisis deskriptif. Hasil uji ANAVA menunjukkan ada pengaruh nyata (P0,05) konsentrasi, kemurnian DNA dan nilai Ct. Hasil uji Tukey produk olahan daging babi: ada beda nyata konsentrasi DNA sampel dan kontrol positif (P0,05), kecuali kornet (P0,05). Kemurnian DNA baso dan daging asap berbeda nyata (P0,05) dengan kontrol positif. Nilai Ct sampel dan kontrol positif berbeda nyata (P0,05), kecuali dendeng (P0,05). Hasil uji Tukey produk olahan daging sapi: konsentrasi DNA baso dan daging asap berbeda nyata (P<0,05) dengan kontrol positif, kemurnian DNA kornet berbeda nyata (P<0,05) dengan kontrol positif. Semua DNA genom sampel terfragmentasi ukuran terendahnya sekitar 250 bp dimiliki kornet dan abon. Produk olahan daging dapat meningkat kuantitas DNAnya dan menurun kualitas DNAnya tergantung pada suhu dan bahan tambahan yang diberikan. Tiga puluh produk olahan daging sapi tidak mengandung DNA babi menggunakan Taqman real time PCR yang sensitif dan cepat serta terverifikasi mematuhi peraturan label.

.....The fast Taqman MGB qPCR method is key to effective meat adulteration surveillance. This research aimed to evaluate the quantity, quality of DNA from processed pork products and the content of pork DNA in processed beef products suspected of containing pork DNA using the Taqman MGB qPCR to verify labels. Five processed pork products, 30 processed beef products: corned, jerky, shredded, meatballs, and smoked meat were used as samples as well as and fresh pork as a positive control were extracted, DNA concentration and purity were measured, electrophoresed, and amplified with qPCR. The DNA concentration, purity, and Ct value were tested by one-way ANOVA followed by the Tukey test, except for the Ct value of processed beef products. The genomic DNA integrity was analyzed descriptively. The ANOVA showed a significant effect (P0.05) on the concentration and purity of DNA and Ct value. Tukey test results for processed pork products: there was a significant difference (P0.05) in the DNA concentration of the samples and positive controls, except for corned (P0.05). The DNA purity of pork meatballs and smoked pork was significantly different (P0.05) from the positive control. The Ct values of the samples and positive control were significantly different (P0.05), except for jerky (P0.05). The results of the Tukey test for processed beef products: the DNA concentration of beef meatballs and smoked beef was significantly

different (P<0.05) with the positive control, and the DNA purity of corned beef was significantly different (P<0,05) with positive control. All genomic DNA samples were fragmented with the smallest size of about 250 bp experienced by corned and shredded. Processed meat products can increase the quantity of DNA and decrease the quality depending on temperature and additives. Thirty processed beef products did not contain pork DNA using the sensitive and fast Taqman qPCR and verified to comply with label regulations.