# Development of A Duplex PCR Assay for the Detection of Adulterations in Chicken and Turkey Meat Products

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## Abstract

Meat adulteration is the process of lowering the quality of meat products by mixing inferior meat or their cheaper counterparts with high value meat or by adding non meat substances into meat products. This can make the food unsuitable for consumption and can cause health issues in people. To protect consumers from this fraudulent and illegal substitution, a method to detect meat adulteration should be designed. Therefore, the objective of this study was to develop a rapid and specific duplex polymerase chain reaction assay for detection of adulteration in turkey and chicken products. DNA extraction from processed meat products was carried out using the Qiagen mericon® food kit and fresh samples were subjected to a manual DNA extraction method. Detection was based on amplifying the species-specific mitochondrial DNA cytochrome *b* gene. Gradient Polymerase Chain Reaction gave 57 $^{o}$C as the best annealing temperature for both chicken and turkey specific primers. Duplex polymerase chain reaction yielded 212 bp and 150 bp fragments for chicken and turkey DNA respectively. Ten processed chicken products were used in this study and all of them were confirmed to be chicken. Chicken sausages, meat balls and ham samples however, were identified to be adulterated with a species other than turkey. Adulterated species can be identified by sequencing the purified gel piece of the nonspecific band in future studies. Despite the non-specific annealing of chicken specific primers to turkey DNA, this polymerase chain reaction assay proved to be a successful and rapid method to detect meat adulteration.

*Keywords - Turkey, Chicken, Duplex PCR assay, Cytochrome b gene*