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Qualitative investigation of meat species in meat products by real time polymerase chain reaction

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Abstract

Identification of meat species in processed meat products is a major problem in meat technology to produce safe and standard meat products. The aim of this study was identification of meat species in meat processed products including sausages and burgers. The study was carried out by targeting a conserved region of mitochondrial DNA and by using Real-Time polymerase chain reaction (RT-PCR) method. Sampling procedure consisted of different types of commercial meat products including susages, burgers, and salamis which were collected from different stores in Qazvin province-Iran. After DNA extraction, RT-PCR assay was performed to detect specific DNA sequences of animal species in meat product samples. Specific DNA sequences for chicken, horse, camel, beef, and turkey meat were detected successfully in collected samples. Consequently, we found in this study that RT-PCR method is a very powerful and easy method for monitoring commercial meat products based on conserved region of mitochondrial DNA.
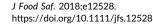
Practical applications

Recently, adulteration in formulation of meat products such as burger and sausages is the principle problem in this industry. Meat species used in this category of products are varied according to type of adulteration and final product. Separately, safety of meat products is dependent on the formulation and the raw materials including meat species used for manufacturing of formulated meat products. In this study, identification of meat species in burger and sausage samples collected from different local stores in Qazvin Province, Iran was performed by Real-Time PCR. This molecular method is a very practical, rapid, precise, sensitive, and useful method for identification of meat species in these products. Chicken, horse, camel, beef, and turkey meat were detected successfully in the collected samples. Also, the quality and adulteration of the collected meat product samples have been determined for the future development of health and quality strategies and investigations.

1 | INTRODUCTION

Meat and meat products consist of many nutrients and minerals recommended as daily intakes; and apparently it is completely logical to trust the label of these products as they go through regular inspection by authorities however, over consuming of these products is prevented due to some nutritional problems. Nutritional value of meat products are changed because of variation in meat composition, ingredients, and conditions of processing. Generally, meat products are produced from different type of raw materials leads to varied physico-chemical, microbiological, and sensory properties. The principal composition of

meat products is associated with used raw materials including protein, water, fat, and pigment contents (Damez & Clerjon, 2013). Meat products are a varied group of those including sausages, burgers, and fish products are made of various meat spices consisting of beef, buffalo, chicken, pork, and fish with different physical processing and spice formulations. Protein functionality a key characteristic as technological aspect of meat and fish processing are directly associated with species of meat as raw material (Falowo, Fayemi, & Muchenje, 2014). Other properties of meat products considered by consumer addition to safety and nutritional aspects are sensory, price, and convenience characteristics. For manufacturing healthier meat products such as sausages, we