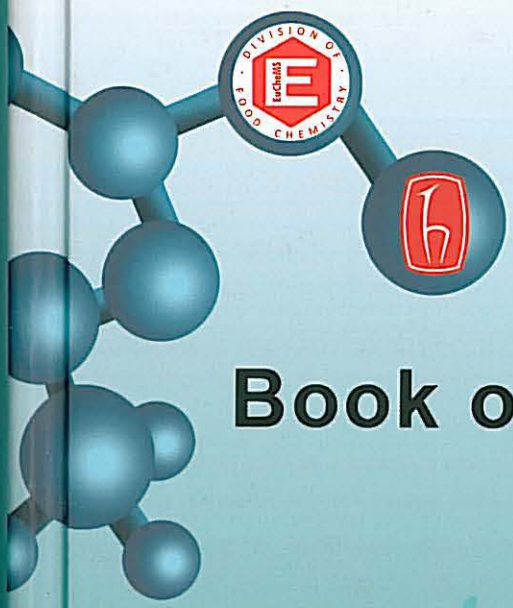
EUROFOODCHEM XVII

May 07-10, 2013 Istanbul, TURKEY



Book of Abstracts

EDITED BY
Hamit KÖKSEL

www.eurofoodchemxvii.org

QUANTITATIVE DETECTION OF PORK'S MEAT BY REAL-TIME PCR FOR HALAL VERIFICATION OF PROCESSED POULTRY MEAT PRODUCTS

Sónia Soares[1], Joana S. Amaral[1,2], M. Beatriz P.P. Oliveira[1], Isabel Mafra[1]

[1]REQUIMTE, Department of Chemical Sciences, Faculty of Pharmacy, University of Porto, Portugal.
[2]Polytechnic Institute of Bragança, Portugal. E-mail: jamaral@ipb.pt

Species identification and the need to verify the labelling statements are currently considered of major importance owing to the increased awareness of consumers regarding the composition of foods. In particular, processed meat products are susceptible targets for frauds such as the substitution of higher value species by cheaper meats species, the presence of undeclared species and the use of lower amounts of meat than the quantities declared on the product's label. These practices represent economical frauds, but can also bring ethical, religious and even health repercussions. Incorrect labelling and the undeclared addition of pork meat in foods with Halal designation represent a major problem for the practice Muslim that forbids the consumption of pork derived foods. For this reason, the fraudulent pork addition is considered as the main authenticity issue this particular group of consumers [1].

The increasing demand for transparency in the meat industry and the enforcement of proper labelling has promoted the development of suitable analytical methodologies for meat species identification. For this purpose, several DNA or protein-based methods have been suggested during the last decade. Protein-based techniques present some advantages when applied to raw meat samples, but results can be limited in highly processed products due to protein denaturation. The superior stability of DNA molecules to withstand heat and pressure processing, and their ubiquity in cells have elected them as the analyte of choice for species identification in processed foods [2].

In this work, a real-time PCR technique was used for pork meat detection in processed poultry meat products. The proposed technique uses the fluorescent DNA intercalating dye SYBR Green, thus presenting the advantage of being a more flexible and less expensive method without the need for individual probe design. The method was validated using blind binary mixtures and subsequently applied to pork meat quantification in commercial poultry meat products (Frankfurters, barbecue sausages, hamburgers and nuggets). The real-time PCR approach was based on the specific amplification of the 18S rRNA mitochondrial gene for pork species (149 bp fragment) and targeting a eukaryotic DNA fragment (140 bp) as a reference gene for normalisation. The specificity was verified by melting curve analysis. Calibration curves were obtained with cycle threshold (Ct) values by using the DDCt method. The detection and quantification of pork meat was achieved in the range of 0.1% to 25%, with a high correlation coefficient and PCR efficiency. Regarding commercial samples, pork DNA was detected in eight samples out of ten that did not declare pork derived ingredients. Nevertheless, only trace amounts (<0.1%) were detected, suggesting the possible occurrence of cross-contamination during industrial production instead of fraudulent malpractices.

Keywords: authenticity; polymerase chain reaction; Halal; pork meat

Acknowledgments: This work has been supported by FCT (grant no. PEst-C/EQB/LA0006/2011) S. Soares is grateful to FCT PhD grant (SFRH/BD/75091/2010) financed by POPH-QREN (subsidised by FSE and MCTES).

[1] Nakyinsige et al., Meat Science 91 (2012) 207–214

[2] Soares et al., Meat Science in press (DOI:10.1016/j.meatsci.2012.12.012)