Abstract Title: Microbial contamination of pig carcasses surfaces at different stages in the slaughter line

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Abstract

The microbial contamination monitorization of carcasses surfaces throughout the slaughter line, enables the hygiene verification of the slaughter operations, which allows us to define new methodologies for quality control and food safety. The main objective of this study was to obtain microbial contamination of carcasses data at different stages of a pig slaughter line.
Three visits were made to a swine slaughterhouse. One hundred and twenty swab gauze samples (ISO non-destructive method) were taken from the surface of the thigh, neck, abdominal and lumbar dorsal areas delimited with sterilized templates (100 cm^2) before evisceration, after scraping (phase A) and after evisceration, immediately before refrigeration (phase B). All samples were analysed quantitatively according to ISO procedures for total numbers of aerobic mesophilic microorganisms (AMM), Enterobacteriaceae (ENT) and generic *Escherichia coli* (GEC).
Analysing the evolution of the microorganisms tested between the two selected phases of the slaughter line, a statistically significant increase from phase A to phase B was observed for AMM ($P < 0.01$), ENT ($P < 0.001$) and GEC ($P < 0.05$) counts. On average, were detected 2.81, 0.36 and 0.29 log CFU/cm^2 in phase A and 3.16, 0.87 and 0.52 log CFU/cm^2 in phase B for AMM, ENT and GEC respectively. In this study, the evisceration step and subsequent handling and improper use of utensils on the carcasses, were considered the most critical points, responsible for the recontamination of the carcasses and increasing counts from phase A to phase B.
The control of the microbial load is important to ensure the hygiene of the processes. Although the microbial loads comply with the limits regulated by the Commission Regulation (EC), the concept of continuous improvement must be taken into account in order to increase meat quality and safety parameters by reducing the possibility of recontamination by pathogenic microorganisms.

Keywords – *Carcasses, Microbial contamination, Slaughter operations, Process control*

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Professional Biography

Márcio Moura-Alves has completed his MS degree at the age of 23 years in Food engineering specialized in Food Safety in 2018 at the University of Trás-os-Montes e Alto Douro, Vila Real; Portugal. Since 2015, he devotes his academic career to food safety with laboratory experience in microbiological analyses. He has developed some scientific works particularly with pathogens as *Listeria monocytogenes* and *Salmonella* Typhimurium. Recently, he is a research fellow in the project "MobFood - Mobilizing scientific and technological knowledge in response to the challenges of the agri-food market" (POCI-01-0247-FEDER-024524).

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