



COMPARISON OF EXCISION AND SWABBING SAMPLING METHODS TO DETERMINE THE MICROBIOLOGICAL QUALITY OF RABBIT CARCASSES

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Purpose. Microbiological criteria are pivotal source of information in developing hazard analysis critical control point and quality management systems of rabbit slaughter plants. Various sampling methods are available but standardized and internationally accepted sampling procedures are recommended, depending on the reason for sample collection. This study evaluates the effectiveness of swabbing and excision for the recovery of microorganisms of rabbit carcasses in relation to the aim of the microbiological examination, the sensitivity required, and practical considerations.

Methods. 12 rabbit carcasses were collected from a large scale rabbit slaughterhouse located in Emilia-Romagna Region, in northern Italy. A total of six samplings were performed by the Veterinary Competent Authority in one variable day within the week (for a total of six successive weeks) using a destructive method by excision technique and a non-destructive method by sponge-stick. Within each sampling event, the sampled animals (*Oryctolagus cuniculus*; two carcasses per sampling) originated from the same slaughter batch, while animals collected on different sampling days originated from different slaughter batches. In each sampling, the same carcass was used for sampling loin and thigh for microbiological evaluations. All samples were transported to the laboratory for the enumeration of ACC (ISO 4833-1:2013/AMD 1:2022) and Enterobacteriaceae (ISO 21528-2:2017). A total of 48 samples were performed and results were expressed as CFU/cm². Statistical analyses were conducted using either the paired t-test or the Wilcoxon signed-rank test, as appropriate based on the data distribution.

Results. Loin and thigh samples of the same carcass present similar microbial contamination for both enumeration

of ACC and Enterobacteriaceae count. A significant difference ($p < 0.05$) existed among the sensitivity of in relation to ACC enumeration by the sampling methods of excision and swabbing, reporting higher level of bacterial recovery with the excision method than swabbing. A delta value ranging from a minimum of 0.33 and a maximum of 2.982 log CFU/cm² was observed between the two samplings methods for ACC, with a median value of 2.15 and 2.00 log CFU/cm² by excision method, and of 1.22 and 1.30 CFU/cm² by swabbing, respectively in loin and thigh samples. Enterobacteriaceae counts were generally low (<1 log CFU/cm²), with a minimum and maximum delta value between sampling methods of 0 and 1.5 log CFU/cm². No significant difference was observed for Enterobacteriaceae count between excision and swabbing. Indeed, the same finding was reported in 7 out the overall 12 samples, in 4 samples excision method yielded higher recovery, and in only one sample swabbing resulted in higher recovery. Swabbing confirms to be more difficult to standardize, with more variable data than excision method resulting in lower repeatability and reproducibility.

Conclusions. Excision seems to be the preferable sampling method for enumeration and monitoring of bacteria on rabbit carcasses but, in relation to practical considerations, further studies involving the use of carcass rinsing for the examination of carcasses of some small species, such as rabbit, should be performed. Indeed literature reported that the rinse method can recover up to two logarithms more than the other techniques. The use of an harmonized sampling method is of interest for both trade in meat and meat products as well as process hygiene control in slaughter establishments by Food Business Operators and Competent Authority.