

P5: Microbiological quality control of minced beef and pork

Silvia Alves¹, Anabela Moreira², Stéphanie Ferreira², Teresa Moreira², Sandra Mota², António Araújo^{2,3},
Manuela Amorim²

¹ School of Allied Health Technologies, Polytechnic Institute of Porto, Portugal

²Department of Clinical Analysis and Public Health, Research Centre on Health and Environment, School of Allied Health Technologies, Polytechnic Institute of Porto, Portugal

³Biogerm SA, Maia, Portugal

Presenting author: silviaalvesss@hotmail.com

Introduction: Food-borne infections are responsible for high rates of mortality and morbidity.

Objectives: To evaluate and compare the results of microbiological analysis of minced beef and pork.

Materials and Methods: We conducted a cross-sectional study on 191 records of microbiological quality control of minced beef (n=134) and minced pork (n=24) samples at the end of manufacturing process, performed during 2014, according to the EC Regulation No. 1441/2007 on microbiological criteria for foodstuffs. Data included process hygiene criteria: aerobic colony count at 30 ° C (satisfactory if $\leq 5 \times 10^5$ CFU/g, acceptable if $\leq 5 \times 10^5 - 5 \times 10^6$ CFU/g, unsatisfactory if $> 5 \times 10^6$ CFU/g), *Escherichia coli* count (satisfactory if ≤ 50 CFU/g, acceptable if 50-500 CFU/g, unsatisfactory if > 500 CFU/g); and food safety criteria: *Salmonella spp.* detection (satisfactory if absent in 10 g). Descriptive statistical analysis (absolute and relative frequencies) was performed to analyze unsatisfactory and satisfactory records.

Results and Discussion: Regarding aerobic colony count at 30 ° C, 66.4% of minced beef samples and 56.1% of minced pork samples presented unsatisfactory results. Minced beef presented a higher number of unsatisfactory results in aerobic colony count, which may be due to the methods of meat processing, since the skin of slaughter cattle (beef) is removed immediately while the skin of pigs is first scalded and then removed, reducing the microorganisms' transfer. In *Salmonella spp.* detection, one (0.75%) sample of beef and one (4.17%) sample of pork were unsatisfactory. *Escherichia coli* count showed unsatisfactory results in 3.7% and 5.3% of beef and pork minced meat, respectively. All other microbiological criteria were satisfactory.

Conclusion: Together, these results show a good microbiological quality, indicating compliance with the hygiene and sanitary recommendations. This microbiological quality control allows improvements in slaughter hygiene and process control.

References

1. Andritsos, N. D., Mataragas, M., Mavrou, et al (2012). The microbiological condition of minced pork prepared at retail stores in Athens, Greece. *Meat Science*, 91(4), 486–9.
2. Stoops, J., Ruyters, S., Busschaert, P., Spaepen, R., Verreth, C., Claes, J., ... Van Campenhout, L. (2015). 3. Bacterial community dynamics during cold storage of minced meat packaged under modified atmosphere and supplemented with different preservatives. *Food Microbiology*, 48, 192–9.
3. Commission of the European Communities. (2007). *Commission regulation (EC) No 1441/2007 of 5 December 2007 amending Regulation (EC) No 2073/2005 on microbiological criteria for foodstuffs*. Official Journal of the European Union.