Mathematical modeling of microbial load in poultry meat fillets according to electrical resistance (Impedance-Splitting Method) and survey on its correlation with total volatile nitrogen

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Achieving the results of total microbial count in minimum time is really important for confidence from the hygienic quality of products. So in this study the impedance – splitting method was considered and the main purpose was to evaluate the correlation between impedance detection time (IDT in hrs), total microbial population (log$_{10}$ N) and total volatile nitrogen (TVN) of poultry meat. 100 samples (50 samples in warm and 50 samples in cold seasons) were collected from Ahvaz areas and examined under sterile conditions. The total microbial count by surface plate technique and impedance – splitting method, also measuring total volatile nitrogen were carried out based on the recommendations of Iran's Standard Institute and Industrial Investigation. Then the calibration curves of 3 methods and their equations were obtained by using Excel software. The calibration curves of methods were elaborated for total microbial count and impedance detection time, demonstrating a good correlation between the two methods in all of samples, cold and warm season samples equal to 97.4%, 98.1% and 97.3% respectively. Also according to the calibration curves, the correlation between impedance detection time and total volatile nitrogen were equal to 82.5%, 81.5%, 85.4% and between total microbial count and total volatile nitrogen were equal to 84.4%, 83.2%, 86.8% in all of samples, cold and warm season samples respectively. Therefore, impedance measurement which is a more rapid, automated and less laborious method than conventional technique could be used as an alternative method for the rapid quality evaluation of poultry meat instead of conventional methods.