

**TITLE:** EVALUATION OF THE EFFECTIVENESS OF ALTERNATIVE METHODS BASED ON MALDI-TOF MS FOR DETECTION OF *Salmonella* spp. IN FRESH-TYPE CHICKEN SAUSAGE

**AUTHORS:** SILVA, L.S.<sup>1</sup>; PROFETA, R.R.A.<sup>1</sup>; SILVA, A.M.<sup>1</sup>; NEUMANN, E.<sup>2</sup>

**INSTITUTIONS:** <sup>1</sup> UNIVERSIDADE FEDERAL DE SÃO JOÃO DEL-REI - CAMPUS DE SETE LAGOAS, MG (RODOVIA MG 424 - KM 47, CEP 35701-970, SETE LAGOAS - MG, BRAZIL).

<sup>2</sup> UNIVERSIDADE FEDERAL DE MINAS GERAIS, BELO HORIZONTE, MG (AVENIDA PRESIDENTE ANTÔNIO CARLOS, 6.627, CEP 31270-901, BELO HORIZONTE - MG, BRAZIL).

**ABSTRACT:**

*Salmonella* spp. is widely distributed in nature and can be isolated from several sources, being contracted mainly due to the ingestion of contaminated food. Of these, chicken meat plays an important role in the epidemiology of human salmonellosis. The present work proposed alternative methodologies, using MALDI-TOF MS, to identify *Salmonella* spp. recovered from food and compared this technique to the reference method (BAM/FDA, 2018). Twelve samples of fresh-type chicken sausage commercialized in the city of Sete Lagoas - MG were used. They were divided in three portions and two of them were intentionally contaminated with *Salmonella enterica* subsp. *enterica* sorovar Typhimurium ATCC 14028 in two concentrations (10 and 1000 CFU/g). The third portion was considered negative control. The portions were submitted to the following analyses: Method 1 - (BAM/FDA, 2018); Method 2 - the steps of biochemical and serological identification were replaced by MALDI-TOF MS identification; Method 3 - suppression of the selective enrichment step and biochemical and serological identification and Method 4 - suppression of the selective enrichment step and identification by MALDI-TOF MS. Other quality analyses, according to current legislation and official methodologies, were performed (Coliforms at 45 °C/g, *Staphylococcus* coagulase positive/g, *Clostridium* sulfite reductant at 46 °C/g). In the samples contaminated intentionally with *Salmonella* in the two concentrations tested, the microorganism was recovered in 100% of the samples when submitted to the methodologies M2, M3 and M4. These results were equivalent to those obtained by the reference methodology. However, the M3 and M4 methodologies failed to detect the presence of *Salmonella* sp. in the control sample, which was positive according to the M1 and M2 methodologies, since the bacterium was probably present in reduced concentrations (<10 CFU/g). At the concentrations tested (C10 and C1000), 82% and 88% of *Salmonella* sp. were detected by the methodologies MALDI-TOF MS (M2) and (M1), respectively. The methodologies M3 and M4 recovered 94% of *Salmonella* sp. With the exception of one sample with *Salmonella* presence, all results were within the allowed by the legislation. The use of the MALDI-TOF MS technique conferred precision and rapidity in the identification of the pathogen, reduced the time of analysis, and identified other species possibly present in the food.

**Keywords:** reference methodology, salmonellosis, mass spectrometry, quality control