

**Title** Nisin–EDTA treatments and modified atmosphere packaging to increase fresh chicken meat shelf-life

**Author** T. Economou, N. Pournis, A. Ntzimani and I.N. Savvaidis

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### Abstract

The effect of nisin and EDTA treatments on the shelf-life of fresh chicken meat stored under modified atmosphere packaging at 4 °C was evaluated. Chicken meat was subjected to the following antimicrobial treatment combinations: Nisin–EDTA treatments (added post-production to the chicken samples) included: N1 (no nisin–EDTA added; control sample), N2 (500 IU/g; no EDTA added), N3 (1500 IU/g; no EDTA added), N4 (500 IU/g-10 mM EDTA), N5 (1500 IU/g-10 EDTA), N6 (500 IU/g-50 mM EDTA), N7 (1500 IU/g-50 EDTA), N8 (10 mM EDTA; no nisin added), and N9 (50 mM EDTA; no nisin added). N3, N4, N5, N6 and N7 affected populations of mesophilic bacteria, *Pseudomonas* sp., *Brochothrix thermosphacta*, lactic acid bacteria, and Enterobacteriaceae. The antimicrobial combination treatments N5, N6 and N7 had a significant effect on the formation of volatile amines, trimethylamine nitrogen (TMA-N) and total volatile basic nitrogen (TVB-N) in chicken meat. The use of MAP in combination with nisin–EDTA antimicrobial treatments resulted in an organoleptic extension of refrigerated, fresh chicken meat by approximately 1–2 days (N2), 3–4 days (N3 and N4), 7–8 days (N5), 9–10 (N7) and by 13–14 days (N6). Chicken was better preserved under treatments N6 and N7, maintaining acceptable odour attributes even up to 24 and 20 days of storage, respectively.