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Spoilage of light (PSE-like) and dark turkey meat under aerobic or modified atmosphere package: microbial indicators and their relationship with total volatile basic nitrogen

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Abstract

1. The aim of this work was to evaluate the shelf life of turkey meat from different colour categories (Pale, Soft and Exudative (PSE)-like), intermediate and dark), packaged under aerobic or modified atmosphere (MAP) conditions; also to establish a relationship between microbial quality and total volatile basic nitrogen (TVB-N), evaluating its capacity for shelf life determination.

2. Breasts were selected according to luminance (L*) and pH_{24}: L ≥ 51 and pH < 5·8 for light colour, 43 < L < 51 for intermediate colour, L ≤ 43 and pH > 5·8 for dark colour. Sliced meat was packaged under aerobic or MAP conditions with 50% N_2 and 50% CO_2, then stored in the dark at 0 ± 1°C for periods of 12 or 25 d. Meat under aerobic conditions was evaluated for microbiological characteristics and TVB-N on d 0,

5 and 12. This evaluation was extended to include d 19 and 25 when samples were under MAP conditions.

3. The dark meat group after 12 d of storage in aerobiosis presented significantly higher plate counts of aerobic mesophilic, psychrotrophic micro-organisms and higher TVB-N than other meat colour categories. The shelf life of turkey meat under MAP was one week longer for intermediate and light colour meat (20 d) than for dark meat. TVB-N values of 20 to 30 mg NH_3/100 g turkey meat correspond to advanced spoilage stages. We proposed 14 mg NH_3/100 g as the limit of freshness acceptability for turkey meat.

4. TVB-N was an indicator of turkey meat microbial spoilage but was not a suitable early predictor for microbial spoilage and in particular for turkey meat stored under MAP conditions because counts of micro-organisms were moderately correlated (Pseudomonas spp. and Enterobacteriaceae) with this index, as they were inhibited by MAP gas mixture and storage temperature used in the present study.

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