

British Poultry Science >

Volume 49, 2008 - [Issue 1](#)

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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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Pages 12-20 | Accepted 31 Jul 2007, Published online: 21 Jan 2008

 Cite this article  <https://doi.org/10.1080/00071660701821675>

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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} : $L \geq 51$ and $pH < 5.8$ for light colour, $43 < L < 51$ for intermediate colour, $L \leq 43$ and $pH > 5.8$ for dark colour. Sliced meat was packaged under aerobic or MAP conditions with 50% N_2 and

50% CO₂, 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 NH₃/100 g turkey meat correspond to advanced spoilage stages. We proposed 14 mg NH₃/100 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.

Acknowledgements

The authors wish to thank the Centro de Investigação Interdisciplinar em Sanidade Animal (CIISA) for their financial support, and the technicians, Maria Helena Fernandes, Paula Carapinha dos Santos, Maria José Fernandes and Maria Pedrosa, for their excellent assistance at slaughterhouse and laboratory.

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