



Application of High Pressure Processing to Improve Turkey Meat Quality

J. T. Y. Chan*, D. A. Omana, and M. Betti
University of Alberta, Edmonton, Alberta, Canada



Summary

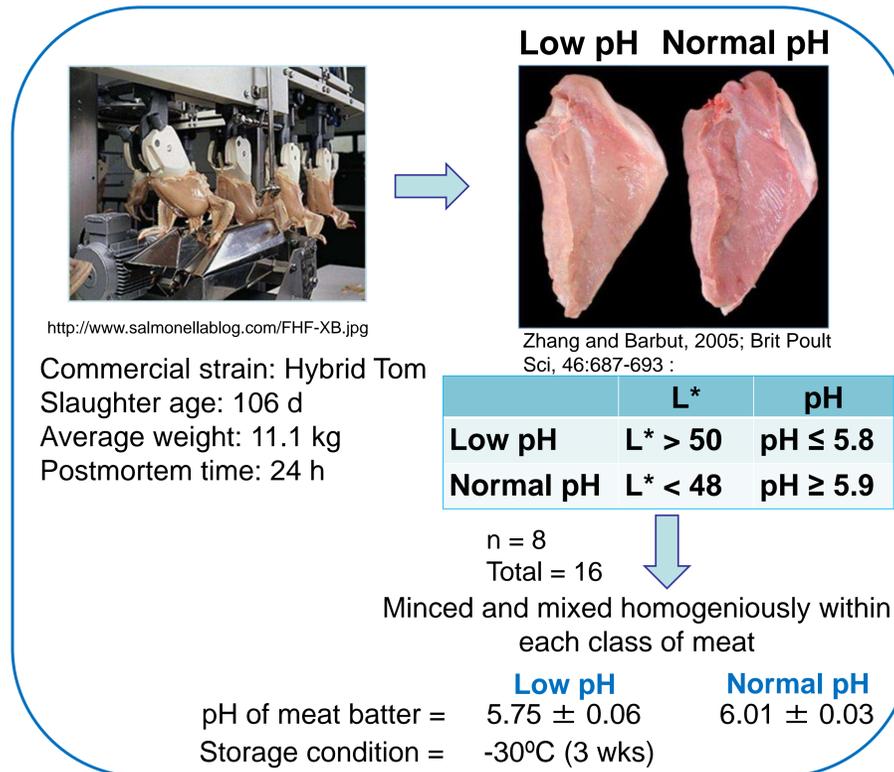
Turkey with pale, soft, exudative (PSE)-like condition is one of the growing concerns in the poultry industry as it affects meat quality, such as water holding capacity (WHC) due to low ultimate pH at 24 h postmortem (pH₂₄). The PSE problem leads to an estimated economic loss of at least U.S. \$200 million per year in the turkey industry; hence, there is a need for better utilization of PSE-like meat for the preparation of further processed products. High pressure processing (HPP) technology is effective in improving meat quality of PSE-like turkey meat, while allowing low salt levels to be used in food processing, producing healthier food products.

Objectives

The purpose of this study was to determine the effects of HPP on turkey breast meat with low and normal ultimate pH at 24 h postmortem and its relationship with pressure induced changes on protein functionality and meat quality.



Materials and Methods



Meat batter: meat (89.5%), sodium chloride (0.5%) and water (10%)

Low pH meat

Normal pH meat

0 (Control), 50, 100, 150, 200 MPa (4 C, 5 min)

Analyses before pressure treatment (Control) and after pressure treatment:

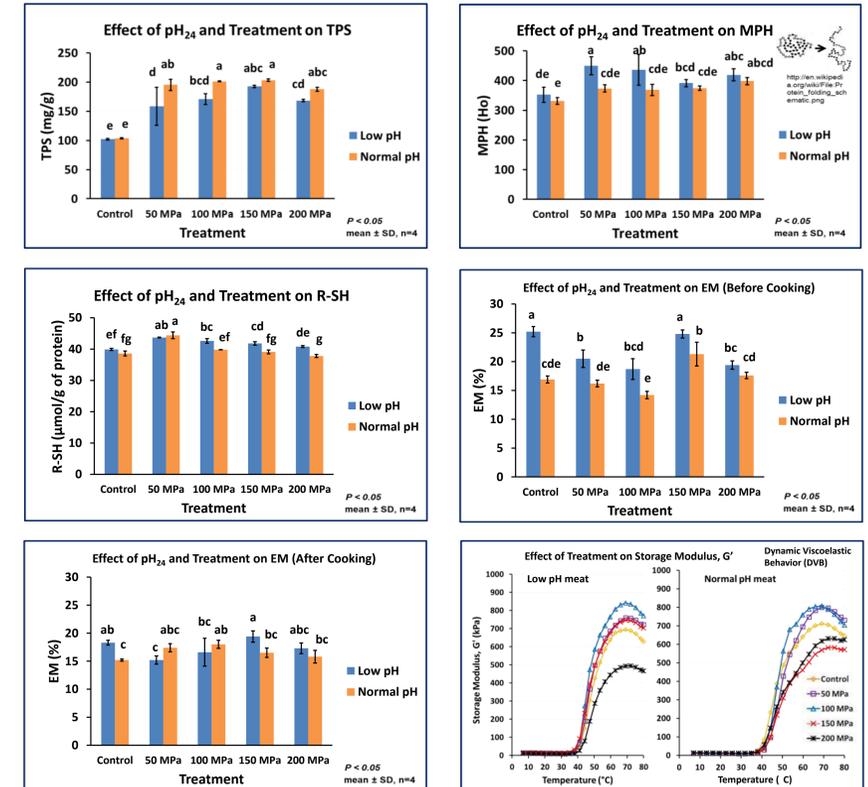
- Total Protein Solubility (TPS) (Van Laack et al., 2000; Poult Sci, 79:1057-1061)
- Myofibrillar Protein Surface Hydrophobicity (MPH) (Kim et al., 2003; Fish Sci, 69:1231-1239)
- Reactive Sulfhydryl Group (R-SH) (Kim et al., 2003; Fish Sci, 69:1231-1239)
- Expressible Moisture (EM) (Omana et al., 2010; Poult Sci, 89:1056-1064)
- Dynamic Viscoelastic Behavior (DVB) (Omana et al., 2010; Poult Sci, 89:1056-1064)

Cook samples in water bath (95 C) until internal temperature reached 75 C

Analysis after cooking:

Expressible Moisture (EM) (Omana et al., 2010; Poult Sci, 89:1056-1064)

Results



Discussion and Conclusions

- Functional properties of low and normal pH meat control samples were not different, except for lower WHC in low pH meat.
- Protein solubility increased in low and normal pH meat.
- Pressure (50 and 100 MPa) increased WHC of low pH meat, to the level of normal pH meat control samples; thereby improving product yield.
- DVB revealed improved gel forming ability at 50 and 100 MPa.
- Partial replacement and/or elimination of additives (i.e. reduced salt and no polyphosphates) is possible using HPP, since it has similar effect on proteins.

Acknowledgements:



Figure 1. Schematic diagram of study design