



Quality Differences in Wooden Breast Meat Marinated with Commercial Ingredients

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Keywords: consumer preference, marination, meat quality, tumble yield, wooden breast
Meat and Muscle Biology 3(2):86-87

Objectives

Wooden breast (WB) is a *Pectoralis major* muscle myopathy that impacts the quality of broiler breast meat, which is a current significant challenge for the poultry industry. While WB has been thoroughly researched in recent years, there has not been a resolution to this issue. Therefore, it is necessary to explore potential solutions to mitigate the undesirable characteristics of WB. The objective of this research was to evaluate differences in quality between chicken breasts classified as normal (NOR), moderately woody (MOD), and severely woody (SEV) that were marinated with control (water), traditional (sodium phosphate and salt), or clean label (potassium carbonate and salt) marinades.

Materials and Methods

Chicken breasts from broilers were graded NOR, MOD, SEV based on the severity of WB. Breasts were sized to 30 ± 2 mm to control variability in breast thickness. Three separate treatment marinades were applied to 40 lb batches of each WB severity 24 h postmortem. Treatments were tumbled for 30 min at 12 rpm under vacuum (20–25 mmHg). Tumble yields were measured. The breasts were individually frozen in a CO₂ cabinet to -62.2°C and stored at -17.8°C . A 3×3 factorial structure within a randomized complete block design with 3 replications of 40 lbs (Day 1, Day 2, Day 3) were used to evaluate the impact of marinade (control, traditional, clean label) and WB severity (NOR, MOD, SEV) on tumble yields. Similarly, a 2×3 factorial structure was used to analyze the effect of marinade (traditional and clean label) and WB severity (NOR, MOD, SEV) on sensory attributes.

Results

When averaged over WB severity, the clean label marinade had a greater tumble yield ($P < 0.05$) than the traditional marinade. When averaged over marinade, the NOR had a greater tumble yield ($P < 0.05$) than the MOD and SEV treatments, which did not differ from each other ($P > 0.05$).

Descriptive sensory results revealed that both marinated SEV were crunchier and less tender ($P < 0.05$) than MOD and NOR, and MOD was less tender ($P < 0.05$) than NOR. The clean SEV was chewier ($P < 0.05$) than all MOD and NOR treatments, but the traditional SEV was only chewier ($P < 0.05$) than the NOR. Interaction was significant ($P < 0.05$) for mushy, initial juiciness, and overall juiciness. These attributes differed ($P < 0.05$) for WB severity but not marinade treatment. When averaged over marinade, NOR was mushier than the MOD, which was mushier than the SEV, and the SEV and MOD were juicier than NOR.

Consumer acceptability results indicated that clean and traditional SEV were less acceptable ($P < 0.05$) than MOD and traditional NOR; no difference ($P > 0.05$) existed between MOD and NOR for both marinades. In addition, when averaging over WB severity, the traditional marinade was preferred ($P < 0.05$) over the clean label marinade. Thus, differences in WB severities were more apparent in the clean label than the traditional marinade, which indicates that even though the clean label samples were tender, it may not be advisable to utilize that marinade formulation in place of traditional marinades with SEV woody breast meat.

Conclusion

The use of salt and sodium phosphate or potassium carbonate in a marinade improves eating quality char-

acteristics of MOD and SEV woody breast. However, differences remain between NOR and SEV in tenderness, gumminess and crunchiness that negatively impact the consumer acceptability of broiler breast meat.