



Using a Potato By-Product to Replace Phosphate in Enhanced Whole-Muscle Turkey Breast

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Objectives

The objective of the study was to determine the functionality of potato starch by-product (PS) as a phosphate replacement in cooked turkey breasts for cook yield, subjective color, objective color, and consumer acceptability.

Materials and Methods

Four inclusion levels of PS (0.2%, 0.5%, 0.7%, and 1%) were tested along with a negative control (no phosphate; NEG) and a positive control (sodium phosphate; POS). Frozen turkey breasts (NAMI #P2015; $n = 36$) were delivered to the University of Idaho Meat Science Laboratory, thawed for 10 d at 2°C, pumped with their respective treatment solutions to 110% of green weight, and placed in individual vacuum sealed cook-in bags. Turkey breasts were tumbled for 30 min, cooked to an internal temperature of 73.9°C, and chilled overnight at 2°C. On d 0, external color was measured on all turkey breasts, and a single breast from each treatment was randomly selected for initial internal color, cook loss, and consumer sensory panel. The remaining turkey breasts were displayed in a glass-fronted retail display case at 3°C for 21 d to simulate retail display. On d 21, the same analysis was conducted as 0 d. Continuous data were analyzed using MIXED procedure of the Statistical Analysis System (SAS Institute, Inc., Cary, NC) whereas binomial data were analyzed using the GLIMMIX procedure; significance was determined at $P < 0.05$.

Results

The model was not significant ($P = 0.19$) with regard to cook yield percentage and therefore no mean comparisons were able to be made. External color on d 0 was not different ($P > 0.05$) between treatments. Internal yellowness was greater ($P < 0.01$) in breasts formulated with 1% PS than all other treatments, whereas redness was greater in POS and 0.7% PS breasts than all other treatments. Subjective color analysis indicated the greatest amount ($P < 0.01$) of two-toning on the cut surface was the 1% PS followed by the 0.7% PS with NEG and 0.2% PS having the least amount of two-toning. Consumer taste panel evaluations were not different between treatment for mean overall acceptance, juiciness, or tenderness. There were significant off-flavors observed between treatments ($P < 0.001$). The 0.7% PS had the most detectable off-flavor and was greater than all other treatments ($P < 0.05$). The NEG treatment had the least frequency of detectable off-flavors ($P < 0.05$). The 0.7% PS had the most frequency of detectable off-flavors with nearly 35% of the respondents reporting.

Conclusion

In conclusion, PS could be an acceptable replacement for POS in cooked turkey breasts if used at levels that do not impart an off-flavor.