QUALITY DIFFERENCES IN TRADITIONAL AND CLEAN-LABEL CHICKEN PATTIES FORMULATED WITH WOODY BREAST MEAT

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I. OBJECTIVES

The objective of this research was to evaluate quality differences between chicken patties composed of different percentages of normal (NOR) and severe (SEV) woody breast (WB) meat and formulated with a control (salt), traditional (salt, sodium phosphate), or clean-label (salt, potassium carbonate) marinade.

II. MATERIALS AND METHODS

Chicken breasts were collected from broilers with an average live weight of 4.2–4.3 kg at a commercial poultry plant. Breasts collected were graded NOR and SEV and stored at 2°C–3°C for 6 d. On the processing day, NOR and SEV WB were ground through a 1.27 cm plate, then a 0.48 cm bone-extracting plate. Meat was combined into 18.1 kg batches. Each meat block was blended with control, traditional, or clean-label marinades. Each batch was vacuum blended at 25 mmHg, chilled with CO_2 to −2.7°C, then formed into patties using a 11 3/4 × 10 4/5 × 25 cm^3 plate (166 g). Ten raw patties were frozen to −62.2°C in a CO_2 cabinet. The remaining patties were belt grilled at 257°C for 75 s, cooked for 12 min at 163°C, 82°C dew point, and 800 rpm fan speed, then individually frozen for 25 min at −62.2°C. Samples were stored at −23°C and evaluated within 3 mo of processing. A 3 × 4 factorial structure within a randomized complete block design with 3 replications (processing dates) was used to evaluate the impact of marinade (control, traditional, clean label) and % NOR (0% NOR, 33% NOR, 67% NOR, 100% NOR) on pH, cook yields, texture profile analysis attributes, and protein bind. A 2 (traditional vs. clean label) × 4 (% NOR) factorial structure within a randomized complete block design with 2 replications (processing dates) was used to determine the impact of % NOR meat on descriptive sensory attributes ($n = 10$ trained panelists) and consumer acceptability ($n = 105$ for traditional and 113 consumers for clean label) of chicken patties within each marinade treatments (traditional and clean label). Means were separated using Fisher's protected least significant difference test. Orthogonal contrasts were also conducted to determine whether there were linear or quadratic effects ($P < 0.05$).

III. RESULTS

The 100% NOR patties had greater cook yields than 33% and 0% NOR patties ($P < 0.05$) and better protein bind than other treatments ($P < 0.05$). Traditional patties had greater cook yields and better protein bind than clean-label and control patties ($P < 0.05$). For texture profile analysis, 100% NOR patties were harder, gummier, chewier, and springier than 33% and 0% NOR patties ($P < 0.05$). For descriptive analysis, 100% NOR patties were chewier and more cohesive than 0% NOR patties ($P < 0.05$), and traditional patties were springier, gummier, chewier, juicier, more cohesive, uniform, and fracturable than clean-label patties

($P < 0.05$). Consumers rated all patties acceptable for appearance, aroma, texture, flavor, and overall acceptability (>6).

IV.   CONCLUSION

Protein functionality was hindered when WB meat was included in chicken patties, which contributed to decreased cook yields. In addition, use of sodium phosphate in the traditional marinade maximized yields and protein bind in the 100% NOR treatment and was superior to the clean-label and control samples, but was less effective in formulations with WB meat. It appears that all WB formulations could be used without a major impact on acceptability, but yields and protein bind decreased as WB amount increased in the formulation and when potassium carbonate was used in place of sodium phosphate.