

Effects of Holding Temperature and Time on Physicochemical Characteristics, Sensory Attributes and Microbial Quality of Marinated Broiler Breast Meat

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Abstract

A study was conducted to investigate the interactive effects of holding temperature and holding time on physicochemical, sensory and microbial quality of unmarinated and marinated broiler breast meat using four different techniques. A factorial (4x2x2) arrangement of treatments in a complete randomized design was used in evaluating four techniques (i.e; unmarinated control, immersion, injection and tumbling), two holding temperatures (4°C and 8°C) and two holding times (4 and 8 h). A total of 128 deboned breast meat samples (weighing 30±5g each) obtained from 32-days old broiler chickens were marinated using a commercial marinade mixture and allocated into treatment combinations. Injection method resulted the highest (P<0.05) marinade uptake. Significant (P<0.05) three-way interactions were observed for cooking yield, cooking loss, external surface yellowness (b*) and internal surface lightness (L*) of breast meat. Injection (all temperature vs time combinations), immersion (4°C-4h and 8°C-8h) and tumbling methods (4°C-4h; 4°C-8h and 8°C-4h) resulted the highest cooking yield (P<0.05). Injection and tumbling marinated meat resulted the minimum cooking loss. Minimum cooking loss was also evident in immersion marinated meat held at 4°C-4h and 8°C-8h. Marination methods (P<0.05) increased the external surface yellowness (b*) than unmarinated control. Marination reduced (P<0.05) the internal surface (L*) of the different marination methods and immersion method resulted the highest L* value (P<0.05) of meat when held at 8°C for 8h. No holding temperature, holding time and marination method interactions were observed for meat pH, marinade loss, drip loss, and meat hardness. Holding at 8°C for 8h after tumbling marination reported the highest score for aroma, surface colour, marinade penetration, colour penetration and overall acceptability. The total microbial counts of all the treatment combinations when tested at 2, 4 and 6 weeks period were ranged between 3.30 and 4.45 log CFU/g. Holding meat at 4°C for 8h after injection marination maximally contributed to the development of the meat quality. Broiler breast meat when held at 8°C for 8h after tumbling marination attracts the panelists most. All the products tested in the present study considered suitable for human consumption within 42 days when stored at -18°C.

Keywords: Broiler breast meat, Immersion, Injection, Marination, Tumbling

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