

Effects of Aging on Moisture-Enhanced Pork Loins

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Summary and Implications

Injection of fresh pork loins with a salt/phosphate/lactate brine to achieve moisture-enhanced quality improvement did not affect troponin-T proteolysis and post-mortem enzymatic tenderization. Consequently, the time of injection post-slaughter is not a critical factor influencing the tenderness of moisture-enhanced pork. Purge, however, was reduced by aging and greater desmin proteolysis was observed. Thus, aging prior to injection may reduce purge from moisture-enhanced pork.

Introduction

The advantages of injection or marination of fresh meat with phosphates, salt and lactate are well-known. This process is widely used for moisture-enhanced pork. However, it is not clear how the process affects protein proteolysis, a postmortem biochemical process that increases tenderness and water holding capacity of muscle.

Materials and Methods

Ninety-six pork loins from 48 carcasses of similar quality were obtained from a commercial plant and separated into two groups. One group was injected with a phosphate/salt/lactate brine on the day following slaughter, while the second group was held at 0-2°C (aged) for 4 days before injection.

Loin chops were cut from the loins and measured for tenderness by Warner Bratzler shear, color by Hunter Lab, purge loss and protein degradation.

Results and Discussion

The results for tenderness measurements are shown in table 1. Loins aged for 4 days had greater shear force values after 7 and 14 days than 1 day after injection. However, chops were collected from the same location on each loin for the comparison of injection time (1 day vs 4 days). This means that samples at different storage times (1 day, 7 days, 14 days) represent different locations in each loin. Of greatest importance is the observation that aging time did not affect tenderness measured 1 day after the injection.

Protein degradation measurements showed the most tender chops to have greatest degradation but degradation

was not affected by the injection treatment. Differences in degradation between different animals remained as an important factor for tenderness and was not altered by time of injection. Color was not affected by the treatments.

Purge loss was decreased by aging prior to injection though all purge losses were relatively low (table 2). Protein degradation analysis showed more degradation of desmin in samples with less purge thus the proteolytic change may improve water-binding ability.

Table 1. Effect of aging treatment and storage time on the Warner-Bratzler shear values (kg/cm²) for injected pork loins.

Aging time before injection	Storage time post-injection		
	1 d	7 d	14 d
1 d	2.61 ^a	2.26 ^a	2.1 ^a
4 d	2.43 ^a	3.31 ^b	3.31 ^b
SEM	0.15	0.15	0.23

Means within the same column with different superscripts ^{a-b} are significantly different (P<0.05).

Table 2. Effects of aging treatment on the purge values for injected pork loins.

Aging time before injection	% purge following storage time post-injection	
	7 d	14 d
1 d	0.88 ^a	1.21 ^a
4 d	0.69 ^b	0.79 ^b
SEM	0.12	0.11

Means within the same column with different superscripts ^{a-b} are significantly different (P<0.05).

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