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Summary and Implications

Chef's Prime™ pork loin roasts were roasted, braised and cooked in a bag at an oven temperature of 325°F to an internal temperature of 160 or 180°F. Roasting improved yield and surface browning of Chef's Prime™ roasts. While roasting and braising resulted in similar quality, the presence of moisture (braising and cook-in bag) reduced cooking time. Cooking in the bag had the greatest impact on quality characteristics as these roasts were least tender and they tended to be less juicy and favorable than braised or roasted loins. Reduction of the final internal temperature from 180 to 160°F did not improve yield or quality. Chef's Prime™ loin roasts can be enjoyed by all consumers when selection of cooking method and cooked quality match consumer need.

Introduction

Consumers across Nebraska and the nation select pork as a meat choice approximately 25 percent of the time. Yet comments persist about dry, flavorless pork. Early cookery practices included cooking fresh pork roasts to 180°F. In efforts to improve the eating quality of fresh pork, the National Live Stock and Meat Board in the early 1980s revised the final internal temperature for fresh pork products to 170°F. In 1988, the National Pork Producers Council (NPPC) revised the final internal cooked temperature recommendation for fresh pork cuts from 170°F to 160°F. A year later, NPPC trademarked the Chef's Prime™ loin roast. The consumption rate and subsequent NPPC changes demonstrate the need for revised quality information for Chef's Prime™ roasts. The primary objective of this research was to determine the influence of final internal temperature and cooking method on yield and quality characteristics of boneless Chef's Prime™ pork loin roasts.

Materials and Methods

Boneless pork loins were purchased, trimmed to 1/8-inch fat, cut according to NPPC specifications for Chef's Prime™ roasts, vacuum packaged and frozen. Three-lb frozen, roasts were tempered 48 hours at 40°F before being placed on a rack in an uncovered roasting pan (roast); placed on a rack in a roasting pan, 1.5 lb water added and tightly sealed with aluminum foil (braise); or placed in a retail cooking bag following manufacturer's recommendations and placed in a roasting pan (cook-in bag). Roasts were cooked at 325°F in a household range to two final internal temperatures (160, 180°F) and three cooking methods (roast, braise, cook-in bag). Four replications were completed.

The weight of each roast was recorded before and after cooking for determination of cooked roast yield (%). Total cooking time for the roasts to reach the appropriate internal temperature was recorded. Sensory quality characteristics were evaluated by an experienced, six-member panel. Tenderness, juiciness and pork flavor intensity were evaluated using a 15-unit unstructured line with 0 = very tough, very dry and lack of pork flavor and 15 = very tender, very moist and very intense pork flavor. Instrumental surface color (Labscan) of the cooked roasts, objective tenderness (Kramer Shear) and final product moisture retention measurements were completed.

Results and Discussion

Yields for boneless Chef's Prime™ pork loin roasts are presented in Table 1. At an oven temperature of 325°F, reducing final internal temperature from 180°F to 160°F did not result in significant yield differences. An oven temperature of 325°F may have been too hot and cooked the meat too rapidly. Subsequently, the anticipated yield differences expected when the internal temperature was lowered were not observed.

Yields tended to be greater for loins that were roasted than for loins that were braised or cooked in the bag (Table 1). Roasting increased moisture retained within the roasts. Roast-

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Table 1. Yield (%) for Chef's Prime™ boneless pork loin roasts cooked by three methods to two internal temperatures.

	Yield (%)[1,a]
Temperature	
160° F	72.6 ± 2.10
180° F	71.9 ± 2.10
Cooking method	
Roast	74.7 ± 2.42
Braise	71.2 ± 2.42
Cook-in bag	70.9 ± 2.42

[1]Values represent least square means and least square standard errors.
[a]Values within internal temperature and cooking method are not significantly different (P≤.05).

ing Chef's Prime™ loin roasts enhanced browning as a golden surface resulted. Surface browning of braised roasts did not develop as the pan was tightly covered with foil, while a minimal amount of surface browning resulted when roasts were cooked in the bag.

Final internal temperature and cooking method influenced cooking time (min/lb). Less time was required to cook Chef's Prime™ roasts to a final internal temperature of 160°F than to a final internal temperature of 180°F. Roasting to 160°F required 43.5 min/lb while roasting to 180°F required 54.6 min/lb. The presence of moisture--added in braising, or trapped in the cook-in bag—reduced cooking time. Mean cooking time was similar for braised and cook-in the bag roasts cooked to 160°F final temperature (35.8 min/lb for braised; 36.4 min/lb for cook-in bag). Braising to an internal temperature of 180°F required 40.22 min/lb while cook in the bag required 40.75 min/lb.

Cooking method influenced sensory tenderness. Roasted Chef's Prime™ loins were evaluated as more tender (P<.05) than loins that were cooked in a bag and were similar in tenderness to braised roasts (Table 2). Cook-in bag roasts were the least tender. Juiciness and pork flavor intensity ratings of Chef's Prime™ roasts were similar for all cooking methods. While sensory scores for cook-in bag roasts were not significantly different, roasts cooked in the bag were ranked as least juicy and lowest in pork flavor intensity. Use of a cooking bag appears to alter pork roasts sensory characteristics. Final internal temperature did not influence tenderness, juiciness and pork flavor intensity of the roasts.

Objective tenderness evaluations (Kramer Shear) are presented in Figure 1 and were influenced by cooking method and final internal temperature. Less total energy was required to mechanically shear braised loins than those cooked in a bag. Kramer Shear peak force (Newton) was less for loins that were roasted to 180°F than for loins roasted to 160°F (P<.05). No differences in Kramer Shear were observed for braised and cook-in bag loins. Maximum force required to shear was greatest for cook-in bag roasts and for loins roasted to 160°F.

Table 2. Sensory Panel Scores[1] for Chef's Prime™ boneless pork loin roasts cooked by three methods to two internal temperatures.

Item	Cooking method[2]			Final internal temperature[2]	
	Roast	Braise	Cook-In Bag	160°F	180° F
Tenderness	8.16 ± 0.89[a]	7.93 ± 0.89[a,b]	6.66 ± 0.89[b]	7.55 ± 0.85	7.61 ± 0.85
Juiciness	6.26 ± 0.95	6.19 ± 0.95	5.63 ± 0.95	6.12 ± 0.91	5.94 ± 0.91
Flavor intensity	6.64 ± 0.89	6.13 ± 0.89	5.78 ± 0.89	6.16 ± 0.46	6.21 ± 0.46

[1]0 = Very tough, very dry, lack of pork flavor; 15 = Very tender, very moist, intense pork flavor
[2]Values represent least square means and least square standard errors.
[a,b]Values for each sensory attribute within cooking method or final internal temperature sharing a common superscript are not significantly different (P≤.05).

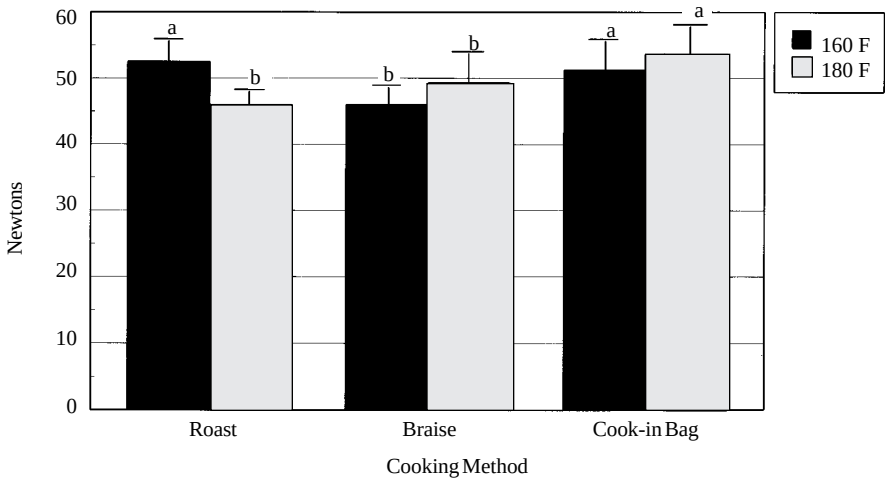

Figure. 1. Kramer peak force (newton) for pork loin roasts cooked by three methods to two internal temperatures. Values represent least square means and least square standard errors. Values for each cooking method sharing a common superscript are not significantly different (P≤.05).

Conclusions

A reduction in final internal temperature did not significantly improve yield or sensory tenderness, juiciness or flavor intensity of Chef's Prime™ loin roasts cooked at an oven temperature of 325°F. Cooking method did influence quality characteristics. Roasting Chef's Prime™ loin roasts enhanced surface browning and improved sensory tenderness. Cook-in the bag loin roasts tended to be less juicy and flavorful than braised or roasted loin roasts. Cooking Chef's Prime™ loin roasts in a bag decreased instrumental tenderness when compared to braised loin roasts.

Adding moisture to the cooking method and reducing final internal temperature shortened cooking time for braised and cook in the bag roasts. Roasting or braising Chef's Prime™ loin roasts is recommended when striving to enhance yield and quality characteristics.

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