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Consumer acceptance of low-dose irradiated, boneless, pork chops (1995)

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**CONSUMER ACCEPTANCE OF LOW-DOSE
IRRADIATED, BONELESS, PORK CHOPS**

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Summary

Acceptance of irradiated, chilled, boneless, pork chops and nonirradiated controls by consumers was not different. Coupled with consumer concerns about food safety and well-documented improvement in consumer attitudes about irradiated foods, the potential for market acceptance is very promising.

(Key Words: Irradiation, Consumer Acceptance.)

Introduction

Recent events involving food borne infections in meat products have increased consumer awareness of possible food contamination with pathogens, especially *Escherichia coli* O157:H7. Of surveyed consumers, 43% were very concerned with food safety. Irradiation is one possible method to increase meat safety, especially when combined with good manufacturing practices. The World Health Organization stated that no toxicological hazard resulted from consuming food irradiated with up to 10 kilograys (kGy). Historically, consumers have rejected irradiation, but several studies indicate that consumer attitudes toward irradiation are changing. Even though the effects of irradiation on the survival of microorganisms in food have been well studied, little is known about the effects of low-dose irradiation on meat quality. Meat quality ultimately will determine consumer acceptance. The objective of this study was to determine consumer

acceptance of chilled, vacuum-packaged, boneless, pork chops exposed to irradiation.

Procedures

Eight center-cut boneless chops from each of seven loins (NAMP #412B) per replication were cut 1.25 in thick. Four chops per loin were assigned randomly to each irradiation treatment (0 and 2.5 kGy). Individual loins and chops were tracked throughout the study. Only chops with NPPC color, firmness/wetness, and marbling scores of 2, 3, or 4; loin eyes of 4.5 to 6.5 in²; and Minolta L* (lightness) values of 40 to 58 were used. Chops were vacuum-packaged. After packaging, chops were boxed and stored chilled at 37 ± 3°F. Boxed product was stored for about 60 h and shipped with arrival within 24 h at FOOD TECHNOLOGY Service, Inc. (Mulberry, FL). After product temperature was stabilized overnight to 37°F, chops were treated with either 0 or 2.5 kGy of radioactive Co⁶⁰. After irradiation, product was stored overnight, returned to Kansas State University, and stored at 37 ± 3°F for about 60 h.

Consumers (n=108) were chosen from a database of 500. Panelists included only those consumers that ate pork or beef at least three times per week. Twenty-eight chops for each treatment for each replicate were broiled to 165°F internally, as measured by thermocouples attached to a temperature recorder. To avoid animal differences, each panelist evaluated treatment samples from the same loin. Each chop was sliced into equal

¹Cryovac North America, Mount Prospect, IL.

²National Live Stock and Meat Board, Chicago, IL.

portions and tested by four panelists. Overall acceptance, meatiness, freshness, tenderness, and juiciness were evaluated using a 9-point scale (1=dislike to 9=like extremely).

Results and Discussion

Approximately 84% of the panelists were between the ages of 26 and 55, and over 50% had at least some college experience. These consumer panelists found irradiated pork chops to be equal to non-irradiated

controls for overall acceptance, meatiness, freshness, tenderness, or juiciness (Table 1). Especially impressive were the high scores for meatiness and freshness. These results were very encouraging, considering that threshold levels of 1.75 kGy for flavor changes in pork have been reported previously. With improving consumer attitudes toward irradiated, vacuum-packaged, boneless, pork chops, the potential for market acceptance is very promising.

Table 1. Mean Scores^a and Standard Errors (SE) for Attributes of Irradiated, Boneless, Pork Chops Evaluated by Consumers^b

Attribute ^c	Dose, kGy		
	0	2.5	SE
Overall acceptance	6.2	6.3	.2
Meatiness	7.3	7.4	.1
Freshness	6.7	6.8	.2
Tenderness	5.8	5.9	.2
Juiciness	5.5	5.7	.2

^a9-point scale (1=dislike to 9=like extremely).

^bn=108; 28 chops per treatment with 4 consumers per chop.

^cNo difference between nonirradiated and irradiated samples (P>0.05).