Extent and Characteristics of Retail Fresh Beef Branding

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Limited information exists regarding the extent and characteristics of branded fresh beef. Retail package data from a sample of grocery stores in three metropolitan areas enabled determining the extent of branded beef for ground beef, roasts, and steaks. Logit models identified factors affecting the probability of beef products being branded, and the probability of beef products carrying specific types of brands compared with store brands and generic (unbranded) beef. The extent of branded beef and type of brand both varied by store type, specific product, quality designation, package type, and presence of special labeling.

Some economists argue the fresh beef case is being transformed from carrying generic commodities to branded products (Lusk 2001). However, there is little documented evidence on the extent of branding and characteristics or attributes of branded beef at the retail level. Expenditures on branded beef increased from 20.8 percent in 1998 to 28.6 percent in 2004, based on Nielsen Homescan household panel data (Martinez et al. 2007). This increase in expenditures on branded products occurred over a period in which overall demand for beef increased in the U.S., based on a widely cited demand index (Purcell 1998; an updated index can be found in Ward and Vanoverbeke 2007). However, it is unclear the extent to which branding is responsible for any demand change.

Information about beef branding and its attributes is needed to improve supply-chain coordination and aid in developing retail beef brands and related marketing programs (Brocklebank and Hobbs 2004; Schroeder and Kovanda 2003). Also important is whether or not retail brands command a price premium in the marketplace (Parcell and Schroeder 2007) and who purchases branded products (Martinez et al. 2007). Despite the apparent growth in branded beef expenditures, relatively little is known about the characteristics of retail branded beef. Are some beef products more likely to be branded than others? Do brands primarily advertise production processes (such as organic) or quality attributes (such as tenderness and marbling)? Do all brands serve the same function both to consumers when evaluating beef purchases and to retailers offering branded products? What percentages of beef packages in a typical grocery store carry a brand?

This article is one of the first to document the extent of branding and detailed characteristics of branded fresh beef sold at retail. As noted above, economists have indicated the importance of retail beef branding but without knowing the extent of branded beef in retail stores and characteristics of branded beef products. We provide evidence from 66 retail outlets in three metropolitan areas both of the extent of and characteristics related to branded beef. Retail outlets were randomly sampled from each of the metropolitan areas, and for each selected retail outlet, in-store data were collected on offerings of fresh beef in three product categories (ground products, roasts, and steaks). Data from retail packages permit beef products to be categorized by type of brands, store type, quality, package type, and special labels. More detail is provided regarding types of brands and branded beef attributes than in any previous study. Logit models provide insight into the factors that influence whether or not and what type of brand a beef product carries.

Consumer Value of Brands

Brands can serve a valuable role for consumers in purchasing beef at retail. Retail products can be described as search, experience, and credence goods (Grolleau and Caswell 2006). Most retail beef products are an experience good in that quality can only be accurately evaluated by experiencing the product, not simply by visual assessment. Consumers in a national, industry-sponsored survey reported the most important attributes of beef were those related to their eating experience (Moeller

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and Courington 1997). Therefore consumers must rely on cues to assess expected quality or expected eating experience (Bredahl 2003). Cues may take multiple forms, including price, special labels, official government quality grades, packaging material, and retail brands.

Most products, including beef, have multiple attributes (Kotler 2000). Consumers' task is to assess multi-attribute products based on the expected utility for their component attributes. Experience with previous purchases guides their formation of attitudes, judgments, and preferences regarding specific attributes. This process underlies the large body of literature stimulated by Lancaster (1966) for hedonic modeling of product traits. Consumers assign a utility to each attribute and jointly weight the importance of each. The value placed on a good is the summation of weights, or marginal implicit price times each attribute.

Brands contribute to consumers' assessment by serving as a quality cue where quality has multiple components (Bredahl 2003; Keller 2003; Kotler 2000). Quality may represent expected utility from physical characteristics of the product such as tenderness, flavor, and juiciness in the case of beef (Menkhaus et al. 1993). These constitute experiential attributes. Brands also serve as a quality cue for attributes which are not physical. Brands may signal utility related to product consistency and may reflect consistency or trust in the retail store or meat department (Keller 2003; Schroeder 2003). Consumers use previous experiences in a Bayesian sense, estimating implicit joint probabilities associated with product satisfaction from various attributes. As such, brands represent a risk-reduction tool for consumers, in effect reducing the likelihood of making an unsatisfactory purchase. They are a reflection of past and guide to future purchases. Brands may convey to consumers actual or implied accountability or responsibility on the part of the retailer or manufacturer.

Finally, brands serve as a link between evaluating attributes of the product with the emotional utility derived from certain attributes (Kotler 2000). These can be characterized as credence attributes. Consumers may prefer a particular product after consuming it even without a measurable difference in quality. An example might be special labels on beef products such as source verification and all-natural beef. Froehlich, Carlberg, and Ward (forthcoming) found differences in consumer preferences for brand or logo appearance in their willingness-to-pay for branded beef, despite holding product quality constant.

Sampling Procedure and Data

Primary data were collected in person during July–August 2006 from retail grocery stores in selected cities within three metropolitan areas: Oklahoma City and Tulsa, Oklahoma, and Denver, Colorado (Dutton 2007). Metropolitan areas were chosen due to their proximity and interests of the parties funding this research. The Denver area represents a large, ethnically and socio-economically diverse population whereas Oklahoma City and Tulsa are smaller, regional population centers. Results reported here can only reflect branded beef marketing in these areas and no attempt is made to extrapolate results to a larger geographic area.

Providing an accurate and representative depiction of the extent and type of branding in these locations required careful attention to developing an appropriate plan for sampling beef products from the population of all available beef products. The first step required an estimate of population size, i.e., the total number of beef products expected to be found in each metropolitan area. An estimate of this figure was obtained by visiting supermarkets in the region to determine the typical number of products per store.

Telephone book yellow pages were consulted to identify the total number of retail beef outlets in each metropolitan area. Total stores compiled numbered 125 in Oklahoma City, 65 in Tulsa, and 150 in Denver. These totals were used along with our estimate of the number of products per store to extrapolate the total population of beef products in each metropolitan area.

The minimum sample size, n, required to achieve the stated level of precision is

$$(1)\quad n = \frac{\sigma^2 z_\alpha^2}{\delta^2},$$

where σ is the expected standard deviation of prices in the population (a number we estimated by visiting several stores); δ is the desired level of precision in units of the mean (i.e., the estimated mean is within

±δ of the true mean), μ; α is the significance level that represents the confidence one can place on the estimated mean falling within ±δ of μ, and z_{α} represents the z-statistic at α, (e.g., $z_{0.05} = 1.96$).

Although this measure frequently is used to determine the minimum sample size, Kupper and Hafner (1989) showed that the formula tends to underestimate the required sample size. They provide a table to relate the calculated *n* above to the appropriate required sample size, n^*. The minimum sample size required was calculated for the estimated mean price of each type of beef product to fall within a three-percent level of accuracy with 95-percent confidence. Calculations determined that at least 14.8 stores in each metropolitan area should be sampled. From the entire population of stores, we drew a sample from each of the three metropolitan areas in the study. Within each metropolitan area, about 20 stores were drawn at random from which to sample beef products.

Once the samples were drawn, the geographic distribution of stores within each area was considered. Each metropolitan area was divided into four quadrants (northeast, northwest, southeast, and southwest), and if there were no stores in the sample in one quadrant, an additional store was drawn for inclusion in the sample from the population of stores in that quadrant. Thus the final sample in each metropolitan area consisted of 22 stores in Oklahoma City, 20 stores in Tulsa, and 24 stores in Denver. From these 66 stores, data were collected on packages of ground beef, roast, and steak in the fresh beef retail case. As shown in Table 1, data were obtained on 461 packages of ground beef, 175 packages of roasts, and 750 packages of steaks.

Store Categories

Sampled stores were categorized into one of four groups; specialty, conventional supermarket, discount (including limited-assortment stores and supercenters), and warehouse club stores. Specialty stores are food stores that specialize in one type of product such as a meat market, bakery, or organic food store. Supermarkets are grocery stores that are primarily self-service, providing all major food departments; conventional supermarkets offer major food departments, non-food grocery products, limited general merchandise, and may also offer a bakery, service deli, or fresh meat butchers. Discount stores include limited-assortment stores that offer products at economy prices and supercenters which have a combination of general merchandise and grocery items, where grocery items account for up to 40 percent of floor space. Warehouse club stores usually require a fee-based membership and both grocery and general merchandise items are offered in large and multi-pack sizes.

Brand Categories

Beef products were divided into three brand categories (program, store, and special/other) plus an additional generic or unbranded category.[1] "Program" brands were those that were breed specific, often national brands (such as Certified Angus Beef). "Store" brands were those unique to a certain store or store chain (such as Blue Ribbon).

[1] No standardization exists for brand nomenclature. Martinez et al. (2007) identify another set of brand types for their study: breed-specific, company-specific, and store-branded.

Table 1. Observations by Product Category and Metropolitan Area.

	Product group			
Metropolitan area	Ground	Roasts	Steak	Total
Denver	136	70	231	437
Tulsa	170	83	275	528
Oklahoma City	155	22	244	421
Total	461	175	750	1,386

"Special/other" brands were those that carried special labels related to production practices such as natural or no hormones added (such as Coleman's Natural) or those that could not be classified into one of the other brand categories. It should be noted that while "special" brands were those that carried special labels, the reciprocal was not always found; i.e., not all products with a special label were branded products. Throughout this article, branded beef refers to the three brand categories and excludes the generic or unbranded category.

Extent of Branded Beef

Ground beef products composed one-third (33.3 percent) of all beef in the study and brands accounted for 22.5 percent of ground products. Fewer roasts were found than ground beef or steaks, which was not surprising since roast purchases are seasonal and roast sales are lower in the summer than winter. Roasts accounted for 12.6 percent of all beef packages in the study, and 46.3 percent of roasts carried a brand name. More steak packages were observed than either ground products or roasts, accounting for more than half (54.1 percent) of all packages in the sample. Here, too, the summer grilling season contributed to a higher percentage of steaks in the retail case than roasts. Brands were more common across the three metropolitan areas for steaks than for the other two product categories, with 50.4 percent of steak packages carrying a brand name.

Martinez et al. (2007) estimated the extent of branded products to be 32.9 percent for ground products and 25.8 percent for whole muscle cuts based on household panel data. Parcell and Schroeder (2007) estimated the extent of brands from household survey data at 15 percent for ground products, 35 percent for roasts, and 35 percent for steaks. Store offerings measured in our study differ but represent actual branded beef in the retail meat case.

Across all product types and metropolitan areas, 40.6 percent of all packages were branded and 59.4 percent were generic. Of branded products, 51.5 percent carried a store brand, 25.8 percent a program brand, and 22.6 percent a special/other brand. Thus store brands composed a much larger percentage than most beef producers and many analysts likely would expect. For example, to producers and others in the beef industry, the emerging image of beef brands is of a national brand for high-quality beef—yet more than half of all branded beef in this sample carried a store brand; and much of that was not higher-quality beef, as will be discussed below.

Store Type

As noted earlier, stores were divided into four categories: specialty stores (such as Whole Foods), supermarkets (such as Safeway), discount stores (such as Wal-Mart), and warehouse club stores (such as Costco). Over 90 percent of package observations came from supermarkets (52.4 percent) and discount stores (40.1 percent).

Supermarkets carried primarily a store brand and generic or unbranded beef (37.4 percent and 34.9 percent, respectively). Discount stores and warehouse club stores carried primarily generic, unbranded beef (93.2 percent and 71.4 percent, respectively). Generic beef accounted for 59.4 percent of all packages in the sample. Across all store types, most types of retail stores carried one or two brands, though some carried no branded beef and three national retail chains carried four brands.

Product Quality

Product quality measures differ for product groups. Quality for ground products was considered based on fat (lean) content. Categories were less than five percent fat (96 percent or higher lean), five–ten percent fat (90–95 percent lean), 11–15 percent fat (85–89 percent lean), 16–20 percent fat (80–84 percent lean), and more than 20 percent fat (79 percent or less lean), versus no indication of fat or lean content. At the two extremes, 6.7 percent of ground products was in the leanest category (96 percent or higher lean) while 24.4 percent was in the least lean category (79 percent or less lean).

Branded beef tended to be leaner than generic beef. For the two leanest categories of ground products, 37.1 percent was branded. At the other end of the quality spectrum, for the two fattiest categories 83.2 percent was generic or unbranded. Furthermore, branded beef was more likely to have a designated fat or lean content than was generic beef. When no fat or lean content was indicated, 79.0 percent was generic beef.

Product quality for roasts and steaks was related

to the U.S. Department of Agriculture (USDA 1997) quality-grade designation. USDA quality grades in descending order of quality are Prime, Choice, Select, and Standard. Beef products with no designation of quality were placed in a "none indicated" category. Across all roast and steak products and metropolitan areas, products with a quality designation represented 30.6 percent of the total, and 60.6 percent carried no USDA quality-grade designation. Consumers' assessment of expected eating quality must come from what they can subjectively ascertain from the product name, brand, special label, and visual appraisal of the product, as opposed to a more objective, third-party assessment.

A considerable percentage of branded beef (60.5 percent) carried no designation of quality, over half of which (56.1 percent) was a store brand. In this case, the brand name may serve as a substitute cue for the USDA quality grade in consumers' minds or a cue for their perception of the retail outlet. It should be recognized that some branded products have quality-grade requirements (such as the upper one-third of the USDA Choice quality grade) even though the products may not be labeled as such. That practice raises the question of how frequently consumers are aware of the quality requirements for products to be branded. Consumers may rely on the brand to purchase the quality of beef they want, whether or not they understand the USDA quality-grade system or quality requirements associated with a brand. When no quality grade was designated, it was typically generic product (56.8 percent of the observations) or a store brand (37.3 percent). Program brands and special/other brands were more apt to be USDA Choice than were store brands.

Package Type

Packaging is important to consumers and retailers. Consumers experience degrees of utility with alternative types of packaging for retail beef (Hoffman et al. 1993). The expected degree of satisfaction with packaging material can be evaluated from previous experience and a visual assessment without having to experience each product. Package types affect convenience, cleanliness, shelf life, and product quality for consumers. These directly or indirectly also affect in-store labor and merchandising costs for retailers.

Beef products in this study came in several package types. Chub packages are unique to ground beef. Chub packaging represented 24.7 percent of ground products across all metropolitan areas, and a high percentage of chub packages (89.6 percent) were generic or unbranded.

The most common packaging type across all beef products was the traditional foam tray, representing 54.6 percent of all beef packages in the sample; a majority of products in foam trays was generic or unbranded (45.8 percent). The fastest-growing segment of packaging types is case-ready products, of which 87.5 percent was generic beef.

Special Labels

Special labels consisted of "no antibiotics added," "no hormones added," "all-natural," "source verified," and "guaranteed quality." Special labels were found on 21.7 percent of all products. Over three-fourths of those (78.4 percent) were of two types: all natural (45.5 percent) and guaranteed quality (32.9 percent).

Unexpectedly, generic products carried the most special labels. Nearly half (49.5 percent) of all products with special labels were generic or unbranded. However, note that this is 49.5 percent is of the 21.7 percent of products carrying special labels. Among branded products carrying a special label, special/other brands accounted for 21.9 percent, followed by store brand (17.9 percent).

Factors Affecting Branding

The previous discussion highlights the extent of branded beef found in the metropolitan areas included in this study by various product characteristics or attributes. But which of these has the largest influence on whether a product is branded? Logit models were used to provide insight into this question.

Beef retailing entails a choice between carrying a branded product or a generic product, and whether the brand is owned by the retail outlet or belongs to another entity, such as a processor or industry organization. Two separate logit models were estimated, each with a different dependent variable and each estimated for a different purpose. In the first model, the dependent variable was branded beef (1) vs. generic or unbranded beef (0). The specific objective of this specification was to determine

factors affecting the probability of a product being branded, regardless of brand type.

There was a tendency for characteristics of store-branded beef to resemble generic or unbranded beef. Therefore, a second specification was estimated where the dependent variable took the value of 1 if a product was one of three types of brands (program, special, or other) and 0 if the product carried a store brand or was generic (unbranded) beef. The specific objective of the second model was to determine factors affecting the probability of a product being branded when store brands were excluded and grouped with unbranded beef. It was hypothesized that significant factors might differ between the two models, but exactly which ones might differ was not clear. As noted above, this is the first study to identify in detail the attributes of branded beef products, and these are the first such models estimated for branded beef products, so we did not have the benefit of insight from previous studies. Both models were estimated independently for ground products, roasts, and steaks.

The general form of the model was

$$(2)\quad z^*_i = \alpha^* + \beta^* x_i + e_i ,$$

where z^*_i is a latent variable representing the propensity of a product to be branded, which is linearly dependent upon x_i (a vector of explanatory variables for product i) and random error e_i (Allison 1999). It is assumed that the product is branded if $z^*_i > 0$. Dependent variables were zero-one categorical dummy variables and included

- store type (specialty or warehouse club, supermarket, and discount)
- product name (ground products: ground beef and ground chuck; roasts: chuck and round; steaks: ribeye, sirloin, round, and T-bone)
- quality (ground products: ten percent fat or less, more than ten percent fat, and none indicated; roasts and steaks: USDA Select or below, USDA Choice or above, and none indicated)
- package type (ground products: chub, foam tray or custom packaging, and case-ready or vacuum sealed; roasts and steaks: foam tray and case-ready or vacuum sealed)
- special label (all-natural, no hormones added, no antibiotics added, source-verified, guaranteed quality, and none).

Logit models calculate a cumulative probability of being in a defined category. The PROC LOGISTIC procedure in SAS (SAS Institute 2002–2003) also reports odds ratios which indicate how much the dependent variable would change with a change in the independent variable. Results for the two models were similar and reasonably consistent within product categories (Table 2). Goodness-of-fit measures indicated the models fit the data quite well. Consistency was found for at least a couple variables in each model over product categories. One or more variables were significant from each of the dependent variable attribute groups: store type, product type, quality, package type, and special labels.

For Model 1, ground products, roasts, or steaks were 4.2–8.1 times more likely to be branded when they carried a special label than when they did not (Tables 2 and 3). Additionally, ribeye steaks were more likely to be branded than were round steaks. All other significant variables in Model 1 increased the likelihood of products being generic or unbranded. Discount stores were 28 times more likely to carry generic products than were supermarkets.[2] Specialty and warehouse club stores also were more likely than supermarkets to carry store-branded or generic products. Ground beef packaged in chubs was nearly five times more likely to be generic than was ground beef packaged in foam trays.

For Model 2, the presence of special labeled products was 4.3–19.2 times more likely to be either a program, special, or other brand than a store-brand or generic product across all product categories. Ribeye steaks and Choice steaks were 1.8–8.6 times more likely to be one of the three brand types than either a store brand or unbranded product than wwere round steaks and USDA Select or lower grade steaks, respectively. Ground products with no quality designation were more likely to carry one of the three types of brands (program, special, or other) than a store brand or no brand. This may relate to some brands having their own quality standards or to the success of marketing programs intended to convey a quality message for specific brands.

Compared to supermarkets, discount stores were more likely to carry a store brand or generic ground beef, while specialty and warehouse club stores

[2] The probability for coefficients with a negative sign is the inverse of the odds ratio.

were more likely to carry store-brand or generic roasts and steaks. Ground beef in chub packages was found to be more than ten times more likely to be a store brand or generic product than was ground beef packaged in foam trays. Roasts and steaks with no quality designation were more apt to be a store brand or generic beef than were roasts and steaks graded USDA Select or lower.

Implications and Conclusions

Based on a one-time assessment of retail beef packages in selected retail grocery stores from three metropolitan areas, the extent of branded beef varies by product category (ground products, roasts, and steaks). Similarly, the extent of branded beef and the type of brand both varied by store type, quality, package type, and the presence of a special label. Two notable findings were that store brands represented a higher proportion of branded products than was expected (51.5 percent), and store-brand beef quality was more similar to unbranded beef product quality than were products carrying other types of brands.

Findings reveal that the proportion of branded products varied by product group. Brands represented 22.5 percent of ground products, 46.3 percent of roasts, and 50.4 percent of steaks. Overall, 40.6 percent of beef packages carried some type of brand.

Factors affecting the probability of beef products being branded and carrying a specific type of brand differed.

- Factors affecting a higher probability of beef carrying *any brand* were special label and specific product (steaks only).
- Factors affecting a higher probability of beef being *generic (unbranded)* were discount stores, specialty and warehouse club stores (steaks only), and chub packaging (ground products only).
- Factors affecting a higher probability of beef being a *program, special, or other brand* were special label, specific product (steaks only), Choice or higher quality (steaks only), and no quality designation (ground products only).
- Factors affecting a higher probability of beef being either a *store brand or generic (unbranded)* were discount stores (ground products only), specialty and warehouse club stores (roasts and steaks only), chub packaging (ground products only), and no USDA quality designation (roasts and steaks only).

Retail beef brands may represent cues for consumer purchasing decisions, but based on this study they are not as consistent as we might expect. For example, retail beef brands do not necessarily convey high quality to consumers. The quality of store-branded beef was closer to generic beef than was the quality of other types of brands. From the manner in which brands are referenced by people in the beef industry, one would typically associate branded beef with higher quality. However, this study found otherwise, unless one excludes store brands from the branded beef group.

Other factors also are important cues for consumers. Store types certainly affect the presence and type of brands. Discount stores consistently carried more generic than branded beef. This certainly has implications for the beef industry, since the most rapidly growing retail food outlet in the past decade has been a discount chain. Quality designation and product name were not as important in determining branded beef as was hypothesized. However, ribeye steaks and USDA Choice steaks were more apt to carry a program, special, or other brand than to carry a store brand or to be a generic (unbranded) product.

One limitation of this study is the scope of the data on which the analysis is based, both spatially and temporally. This study represents an initial effort to better understand the extent and characteristics of branded beef as well as factors affecting retail fresh beef brands. However, the authors admit its limitations in scope due to resource constraints. An expanded study should include data from more metropolitan areas than the three in this study, which would encompass a broader range of retail firms and potentially a broader array of brand strategies by retailers. An expanded study also should collect data over several weeks or months rather than a single point in time as in this study, which would provide additional information to better understand branded beef marketing from a more dynamic viewpoint. Lastly, this article provides insights into the extent and characteristics of branded beef by several attributes, but does not address retail firm strategies for merchandising branding beef or consumer preferences for retail beef brands or retail beef attributes.

Table 2. Logit Model Results. Model 1 = Probability of Branded vs. Generic Beef; Model 2 = Probability of a Program, Special, or Other Brand vs. Store Brand or Generic Beef.[a,b]

	Model 1			Model 2		
Dependent variable	Ground products	Roasts (Coefficient)	Steak	Ground products	Roasts (Coefficient)	Steak
Intercept	-5.592***	0.49**	1.012***	-1.391***	0.166	-1.684***
	(12.51)	(5.97)	(58.30)	-39.46	-0.30	-6.63
Store type						
Specialty/warehouse			-1.534***		-1.596***	-0.965***
			(20.89)		(7.39)	(6.86)
Supermarket	Base	Base	Base	Base	Base	Base
Discount	-3.357***	-4.572***	-3.672***	-2.651***		
	(63.02)	(19.48)	(211.00)	(39.85)		
Product type						
Ground beef						
Ground chuck	Base	Base	Base	Base	Base	Base
Chuck roast						
Round roast	Base	Base	Base	Base	Base	Base
Ribeye steak			0.483**			0.615**
			(4.49)			(5.16)
Sirloin steak						
Round steak	Base	Base	Base	Base	Base	Base
T-bone steak						

[a] Includes only significant variables at 0.10 level.
[b] Numbers in parentheses are calculated Wald Chi-Square statistics; *=0.10, **=0.05, and ***=0.01 significance level.

Table 2. Logit Model Results. Model 1 = Probability of Branded vs. Generic Beef; Model 2 = Probability of a Program, Special, or Other Brand vs. Store Brand or Generic Beef[a,b] (Continued).

	Model 1			Model 2		
Dependent variable	Ground products	Roasts (Coefficient)	Steak	Ground products	Roasts (Coefficient)	Steak
Quality						
Fat 10 percent or less						
Fat >10 percent	Base	--	--	Base	--	--
USDA Select or lower	--	Base	Base	--	Base	Base
USDA Choice or higher						2.154***
						(10.42)
None designated				1.171***	-3.204***	-2.358***
				(9.01)	(34.42)	(10.72)
Package type						
Chub	-1.602***			-3.734***		
	(16.08)			(12.83)		
Foam tray/custom wrap	Base	Base	Base	Base	Base	Base
Case-ready/vacuum-sealed						
Label						
Special label	1.450***	2.100**	2.011***	1.464***	2.786***	2.956***
	(21.33)	(4.81)	(30.48)	(17.73)	(14.36)	(51.86)
None designated	Base	Base	Base	Base	Base	Base
Likelihood ratio	127.12***	84.39***	392.28***	99.37***	58.51***	352.17***
Percent concordant pairs	73.0	63.6	79.5	77.7	78.8	89.0

[a] Includes only significant variables at 0.10 level.

[b] Numbers in parentheses are calculated Wald Chi-Square statistics; *=0.10, **=0.05, and ***=0.01 significance level.

Table 3. Odds Ratios for Significant Logit Model Variables. Model 1 = Probability of Branded vs. Generic Beef; Model 2 = Probability of a Program, Special, or Other Brand vs. Store Brand or Generic Beef.

	Model 1			Model 2		
Variable	Ground products	Roasts (Point estimate)	Steak	Ground products	Roasts (Point estimate)	Steak
Store type						
Specialty/warehouse			0.216		0.203	0.381
Supermarket	Base	Base	Base	Base	Base	Base
Discount	0.035	0.010	0.025	0.071		
Product type						
Ground beef						
Ground chuck	Base	Base	Base	Base	Base	Base
Chuck roast						
Round roast	Base	Base	Base	Base	Base	Base
Ribeye steak			1.621			1.850
Sirloin steak						
Round steak	Base	Base	Base	Base	Base	Base
T-bone steak						
Quality						
Fat 10 percent or less						
Fat >10 percent	Base	--	--	Base	--	--
USDA Select or lower	--	Base	Base	--	Base	Base
USDA Choice or higher						8.617
None designated				3.226	0.041	0.095

Table 3. Odds Ratios for Significant Logit Model Variables. Model 1 = Probability of Branded vs. Generic Beef; Model 2 = Probability of a Program, Special, or Other Brand vs. Store Brand or Generic Beef (Continued).

	Model 1			Model 2		
Variable	Ground products	Roasts (Point estimate)	Steak	Ground products	Roasts (Point estimate)	Steak
Package type						
Chub	0.201			0.024		
Foam tray/custom wrap	Base	Base	Base	Base	Base	Base
Case-ready/vacuum-sealed						
Label						
Special label	4.263	8.131	7.470	4.323	16.223	19.227
None designated	Base	Base	Base	Base	Base	Base

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