

**An Examination of Consumers' Preferences for
Differentiated Beef Products**

by

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Forward

This report was developed in an effort to review data and research available related to the market for local beef in Tennessee. While not meant to serve as a publication for use directly “as is” for most Extension audiences, the information in this report will be used in several ways. First, the report will assist Tennessee Value-Added Beef Program partners in understanding the market for local beef and developing educational presentations and materials to help producers analyze the market for their potential products. In addition, the report is helpful in identifying needs for additional market research to support educational programs and technical assistance efforts for value-added beef enterprises.

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Background

In Tennessee, the beef cattle industry contributes \$988.7 million (2010\$) in direct and indirect economic activity to the state's economy, which supports 16,541 jobs¹ (MIG, 2010). In 2010, the number of cattle and calves in Tennessee totaled just over two million, with 5 thousand cattle and calves on feed (USDA/NASS, 2011; USDA/NASS, 2010). Based on the number of head, Tennessee's beef cattle industry is ranked 9th and for all cattle and calves is ranked 15th in the United States (TDA, 2011). According to the Census of Agriculture, in 2007 there were 42,344 farms with beef cows totaling 1,927,638 cattle making the typical herd size 45.5 head per farm (USDA/NASS, 2007). Beef cattle production occurs in every county of the State, with middle and eastern Tennessee having the greatest numbers (Figure 1). For agricultural operations, raising cattle is the leading agricultural enterprise in which Tennesseans are involved. Most of the state's beef operations are cow-calf (88 percent) with the remaining 10 percent being backgrounding or stockering² operations.

Tennessee does not have large-scale³ slaughtering. Most of the beef produced is shipped to feedlots out of state or to smaller slaughtering facilities. According to the Tennessee Department of Agriculture in 2010, there were 14 federally inspected beef slaughter facilities that processed 40,500 head (TDA, 2011). It is estimated that 750,000 feeder calves in Tennessee are marketed to backgrounding operations and feedlots in the Midwest and High Plains annually (Neel, 2010). This

¹ Includes both full- and part-time jobs as well as self-employed.

² Stocker operations purchase young, lightweight calves and are fed on pasture until a desired weight is achieved to move to a feedlot or used as replacements. Backgrounding is the preparation of young cattle for feedlots feeds (McKinley *et al.*, 2004; Lardy, 1998).

³ The definition of "large-scale" changes with time. Slaughter facilities are now more concentrated and in close proximity to where cattle are fed. In 2007, Kansas, Texas, Nebraska, Oklahoma, and Colorado had the largest proportion of custom fed cattle shipped directly for slaughter, accounting for close to 80 percent of the U.S. total (USDA/NASS, 2007). According to USDA's Food Safety and Inspection Service (FSIS) 1996 Pathogen Reduction/Hazard Analysis and Critical Control Point (PR/HACCP) rule, large plants have 500 or more employees, small plants have 10 to 499 employees, and very small plants have fewer than 10 employees or annual sales less than \$2.5 million (Ollinger *et al.*, 2004).

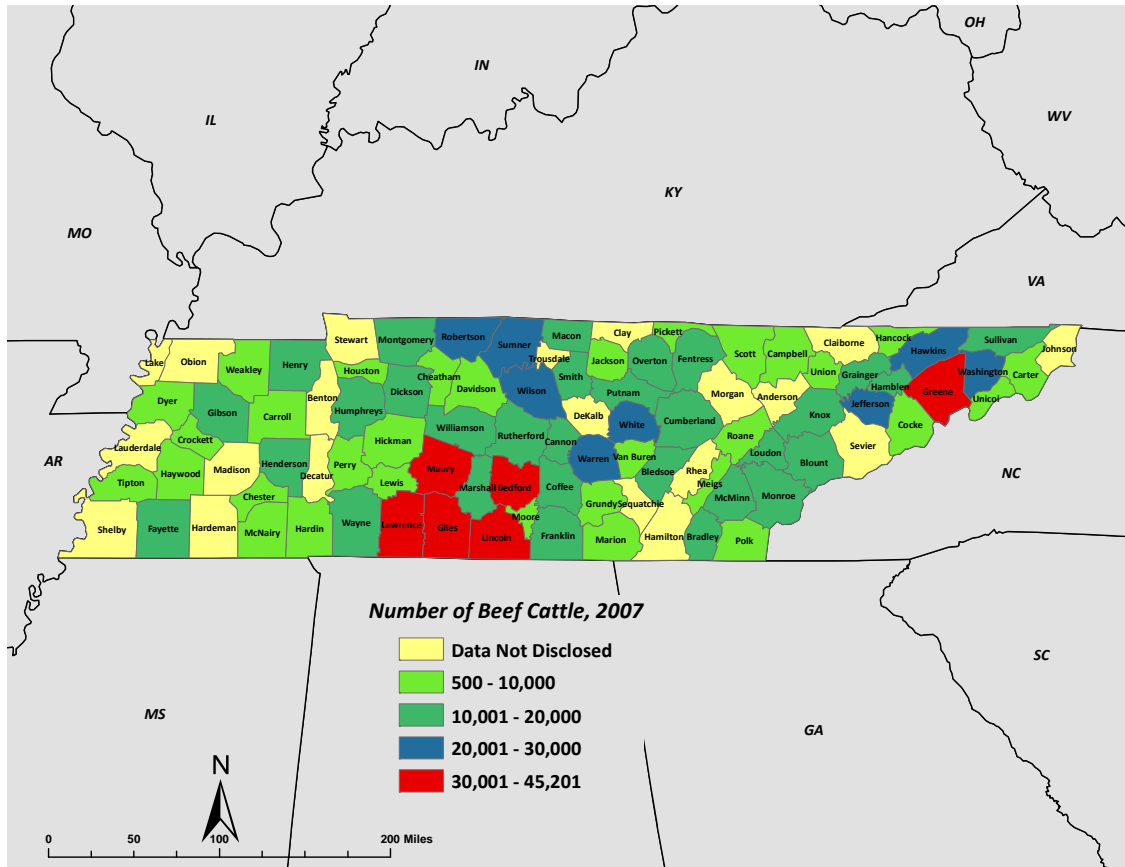


Figure 1. Location of Beef Cattle by County in Tennessee, 2007.

Source: USDA/NASS, 2007

traditional marketing system for bringing cattle to market has primarily been commodity-oriented, but a more consumer-oriented market where consumers may be willing to pay more for differentiated meat products (i.e., grass-fed, environmentally friendly, organic, hormone and antibiotics free, traceable, branded, locally produced, natural, etc.) has been gaining strength (Campiche *et al.*, 2004; Abidoye *et al.*, 2011). Evans (2007) notes that the conventional production systems and profit margins do not favor cow-calf producers and proposes “a need to analyze alternative beef production and marketing strategies that facilitate enhanced profitability and simultaneously address surging consumer demand for specialty food products...” (Evans, 2007, ii). In addition, the traditional USDA beef quality grading system of “Prime” or “Choice” rewards the quantity of intramuscular fat or marbling in beef. Other quality grades include “Select” and “Standard”. Fat types (i.e., saturated versus unsaturated) have

become a major health concern to some consumers over the years. However, some consumers, including the grain-fed beef industry, believe fat contributes to flavor, juiciness and tenderness of the meat, which are also important characteristics to consumer preferences in meat. The current beef grading system is based on saturated or unhealthy fat (McCluskey *et al.*, 2005).

Various methods exist for getting beef in the marketplace for human consumption. One method is via using USDA inspected facilities where meat entering commerce may be sold across state lines, via the Internet or mail order. In some states, state inspected processing plants are available but the meat can only be sold within the state, which would include online sales, mail orders and other sales method for meats too. However, since 1971, Tennessee state inspection of meats has not been available. Tennessee relies on federal inspection instead. Some meat producers may keep ownership of the meat and sell directly to individual consumers, grocery stores, and restaurants or other venues. Custom processing facilities are available for producers wishing to *sell* live animals to consumers for their use. In addition, the Tennessee Department of Agriculture (TDA) permits custom meat processing for meat *not for sale* or for personal use (Bruch, 2010; Dalton *et al.*, 2003; Dunlap *et al.*, 2008).

The objective of this analysis is to provide information on the potential for Tennessee beef cattle producers selling locally produced and/or differentiated beef products in Tennessee. In order to accomplish this objective a review of the literature concerning consumers' acceptability/preferences and willingness-to-pay (WTP) for differentiated meat products will be presented. From these studies, a "target consumer" profile will be constructed based on socio-demographic factors influencing consumers' purchases of these products. Once the "target consumer" profile has been developed, a spatial representation of the counties in Tennessee which match these socio-demographic attributes will be created to identify most likely markets. Next, a review of Tennessee's USDA meat slaughtering facilities will follow along with information derived from contacting the facilities concerning number and type of animals slaughtered. A discussion of direct-to-consumer sales will ensue next with price

information given for Tennessee producers marketing and selling a differentiated beef product attribute directly to consumers. And finally, a discussion focusing on potential implications for Tennessee’s meat producers will follow.

National Market Trends

The beef cattle industry contributes over \$172.3 billion (2010\$) in direct and indirect economic activity to the U.S. economy, which supports close to 1.1 million jobs⁴ (MIG, 2010). U.S. per capita beef consumption peaked at 88.8 pounds (boneless weight) in 1976 and has steadily declined since that timeframe to 58.1 pounds in 2009, a 34.6 percent decrease (Figure 2). Given Tennessee’s population, this equals about 332.6 million pounds of beef are consumed in the state.⁵ For the other leading meats consumed in the United States, pork per capita consumption has remained relatively constant, whereas chicken consumption has increased from a low of 9.3 pounds in 1935 to 56.0 pounds in 2009 (USDA/ERS, 2011). For 2009, the U.S. average annual per capita expenditures for beef was \$261.90, and \$145.00 and \$140.88, respectively, for pork and broilers (Figure 3) (National Cattlemen’s Beef Association, 2012).

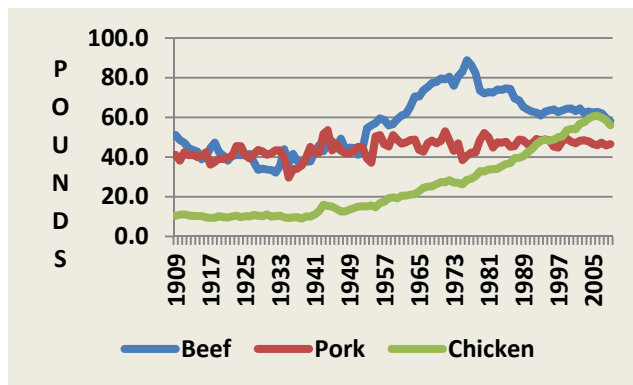


Figure 2. U.S. Average Annual Per Capita Consumption of Leading Meats (Boneless Weight), 1909-2009.

Source: USDA/ERS, 2011

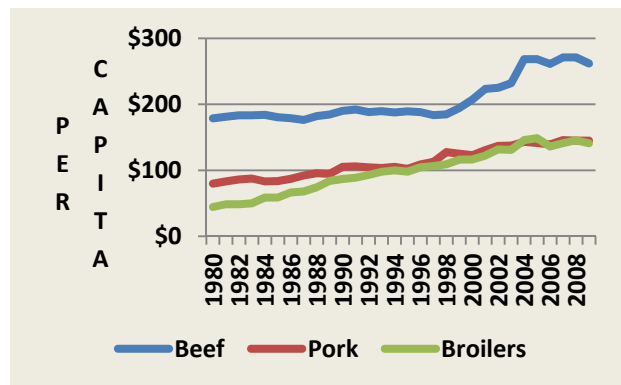


Figure 3. U.S. Average Annual Per Capita Expenditures for Leading Meats, 1980-2009.

Source: USDA/Cattle-Fax/National Cattlemen’s Beef Association, 2012

⁴ Includes both full- and part-time jobs as well as self-employed.

⁵ U.S. Census 2010 population minus percentage of persons less than five years of age multiplied by 56.0 pounds per capita.

Willingness-to-Pay Studies

There are numerous studies focusing on consumers' acceptability/preferences and willingness to pay (WTP) for differentiated beef products. Many provide socio-demographic information for the consumer most likely to purchase these products. The value-added or differentiated meat product attributes this study will focus on are either single or a combination of meat attribute segments such as grass-fed, hormone/antibiotics free, traceable, environmentally friendly, branding, bundling of attributes, locally produced, natural and regionally produced, and humane treatment. A summary table outlining the various socio-demographic variables for the studies reviewed in this section is presented in Table 1.

Table 1. Consumers' Preferences and Willingness-to-Pay Socio-Demographics for Differentiated Beef Product Segments

Product	Age	Education	Gender (Female)	Income	Household Size	Other
Determining Consumer Perceptions of and WTP for Appalachian Grass-fed Beef: An Experimental Economics Approach (Evans, 2007)	+	+	+	-	+	Previously purchased grass-fed beef (+); health concerns (+); price important in beef purchases (-); outlet meat purchases (+); in-home prep frequency (+); local production ranking (+); surveyed in urban area vs. urbanizing area (+); typically look for Choice grades or higher (-)
WTP for Branded Fresh Beef Products in Canada (Carlberg, Freohlich, and Ward, 2007)	+		+	+		In-home prep frequency (+); Product's name (+)
U.S. Consumer Preference and WTP for Domestic Corn-fed Beef Versus International Grass-fed Beef Measured Through an Experimental Auction (Umberger, Feuz, Calkings, and Killinger-Mann, 2002)						Flavor (+)

Table 1. Consumers' Preferences and Willingness-to-Pay Socio-Demographics for Differentiated Beef Product Segments (Cont.)

Product	Age	Education	Gender (Female)	Income	Household Size	Other
WTP for Environmentally Friendly Beef in Georgia (Wong, 2009)		+				Previous purchases of branded/Labeled Goods (+); environmentally concerned (+)
Forage-Fed Beef Attributes: Customer Preferences and WTP (Fields, Prevatt, Lusk, and Keith, 2006)			+	+		Free from growth hormones or antibiotics and traceability back to the farm (+); small cuts (+)
Consumers' WTP for Locally Produced Ground Beef: A Case Study (Chang, Underwood, Langelett, and Xu, 2012)						Grass-fed & Organic (-); beef cuts (-); brand differences/leanness (+)
Impacts of Consumer Characteristics and Perceptions on WTP for Natural Beef in the Southern Plains (Campiche, Holcomb, and Ward, 2004)						Previous meat purchasing behavior & perceptions (+); purchased other natural/organic foods (+); positive attitude toward natural beef after reading a description (+); not affected by brand (-); checks labels (+)
Consumers' WTP for Retail Branded Products with Bundled Attributes (Franken, Parcell, and Tonsor, 2011)*	+		+	+		Health concerns (+); U.S. produced Choice grades or higher (+); moderate likelihood seek more information about grassland management and nature friendly beef or purchase nature friendly beef (+)
Does Altruism Play a Role in Determining US Consumer Preferences and WTP for Natural and Regionally Produced Beef? (Umberger, McFadden, and Smith, 2009)	+			+	-	Natural beef safer than conventional beef (+); quality, perceptions, nutrition, and safety (+); antibiotic and hormone usage (+); humane treatment of animals (+)

Note: To denote whether the socio-demographic variables in the studies positively or negatively influence preferences for the differentiated beef products investigated, the symbols + or – are used.

*For branding to be successful, animal welfare traits in combination with other attributes may be required; potential successful bundling strategies noted by the authors include organic, all natural, and low carbon footprint and grass-fed/lean and locally and US produced; or natural friendly, low carbon footprint, organic, all natural, and grass-fed/lean or locally and US produced and possibly all natural and grass-fed lean (Franken, Parcell, and Tonsor, 2011).

Grass-fed

Evans (2007) studied consumers' perceptions and WTP for grass-fed beef in the Appalachian region, hypothesizing "grass-fed" brings certain quality attributes appealing to consumers. Of the consumers' sampled, a majority of the consumers preferred grass-fed steaks and ground beef used in the study noting leanness and favorable fatty acid composition traits more importantly rated than the production process. Consumer characteristics that positively influenced consumers' preferences for grass-fed steaks included age, educational attainment, being female, household size, has previously purchased grass-fed products, concerned about health, tendency to purchase meat products in outlets, and frequency of in-home meat preparation. Consumers' income and price were found to be negatively associated with meat purchases.

Domestic Grain-fed vs. International Grass-fed

Umberger *et al.* (2002) analyzed consumers' preferences and WTP for domestic corn-fed beef versus international grass-fed beef. Because of international trade, there is a greater selection of products from which consumers can choose are becoming available. Noting that flavor in beef products as an important consumer preference, a study would be of interest to compare consumers' preferences for beef products from countries that finish cattle on grass instead of corn. In this study, grass-fed steaks imported from Argentina were compared with corn-fed USDA Select steaks. The results indicate that consumers can differentiate between the two and are WTP a premium for their preferred steak.

Grass-fed, Hormone-Free, and Traceable

Fields *et al.* (2006) conducted an Alabama forage-fed beef study to evaluate consumers' demand for pasture-fed, hormone-free, traceable beef. Noting the limited data on the subject matter and believing consumers' prefer in most cases a WTP for healthier products, the results indicate that individuals prefer pasture-grazed, growth hormone or antibiotic free, and beef traceable back to the farm. Preferences for pasture-fed beef increased along with the WTP premium when information was

provided on its health benefits. With no health information, the WTP premium declined. Consumers with the stronger preferences included females with higher income preferring no added hormones and traceability back to the farm.

Environmentally Friendly

In a survey study looking at consumers' preferences and WTP for environmentally friendly beef in Georgia, Wong (2009) notes that organic, grass-fed, and environmental friendly are the three main niche markets affecting beef producers. Because of increase economic pressure from the pork and poultry industries as a result from promoting their health benefits, certification labels and brands differentiating beef product segments have increased because of economic pressures forcing beef producers to re-evaluate production and marketing techniques. For this study, environmental friendly certification entails environmental stewardship, farm profitability, and prosperous farming communities. More specifically, environmental friendly in the study entailed ground and underground water contamination protection, erosion reduction via land management practices, and air pollutant reduction. The majority of those surveyed (53 percent) were WTP for environmental friendly beef. Education, previous purchases of branded/labeled goods, and how concerned they were for the environment positively affected consumers' preferences.

No Growth Hormones or Antibiotics

Campiche *et al.* (2004) studied consumer characteristics and perceptions on WTP for natural beef (no growth hormones or antibiotics used) in the Southern Plains (Kansas, Oklahoma, and Texas). The authors note that natural beef producers need higher returns to offset the increased production costs that entails from not using antibiotics and growth hormones (decline in average daily gains), less efficiency in feed conversion, increase marketing, and time. In addition, the labels and packaging used to market their product need to capture consumers' attention. From this study, factors influencing consumers' purchases of natural beef include previous meat purchasing behavior and perceptions,

previous other natural/organic food purchases, positive attitude toward natural beef after reading a description, and those consumers that check labels. Brand in this study did not significantly influence meat purchasing behavior. The authors further note that in order to increase natural beef purchases, marketing strategies may be required for various respondent groups including contracting with stores before using this type of production method.

Branding and Value-Added Attribute Bundling

Two studies look at consumers' WTP for branded fresh beef products (Carlberg *et al.*, 2007; Franken, 2011). According to the National Cattlemen's Beef Association, branded beef promises the consumer a consistency of attributes (i.e., taste consistency, tenderness, flavor, etc.) and is comprised of the three categories breed specific (i.e., Certified Angus Beef™), company specific (i.e., Laura's Lean Beef™), and store branded (National Cattlemen's Beef Association, 2012). Carlberg *et al.* (2007) notes a product's name positively influences consumers' WTP for branded beef. Age had a negative influence on premiums, whereas frequency of beef eaten per week, confidence in choosing beef products, gender, and income only sporadically influenced premiums. Franken *et al.* (2011) investigated bundling value-added attributes to influence consumers' perceptions and WTP for beef steaks. Information was gathered in 2010 via an online survey in the Kansas City and St. Louis, Missouri area. An example attribute bundle included U.S. produced, locally⁶ produced, all natural, grass-fed/lean, nature friendly (habitat conserving), and low carbon footprint. Findings from their results suggest that consumers' perceive nature friendly, organic, all natural, low carbon footprint, and grass-fed/lean similarly, including locally and US produced and all natural and grass-fed/lean attributes. One potential branding strategy recommended by the authors is to combine nature friendly with organic or all natural and possibly

⁶ USDA is currently involved in a *Know Your Farmer, Know Your Food* campaign commitment originated by President Obama to strengthen local and regional food systems. With food dollars and other monies spent locally, not only do monies stay within the community but as a result of the multiplier effect greater economic benefits accrue to the area. For this program, local is defined as within 400 miles or within the state in which a commodity was grown or raised (USDA, 2012).

grass-fed/lean attributes. Positive socio-demographic influences on WTP premiums included high income, young females, with concerns for health.

Locally Produced

Chang *et al.* (2012) studied consumers' WTP for locally produced ground beef in rural South Dakota. The authors note that the Midwest has the highest beef consumption and, among all beef cuts, ground beef has the largest market share—a niche market suitable for local small- and medium-scale producers. Attributes considered were brand difference, price, leanness, cut difference, grass-fed, and organic. Brand difference and leanness were the most influential in determining consumers' preferences. The remaining attributes—cut difference, grass-fed, and organic—were less influential. Other product attributes not influencing WTP premiums included cut difference (sirloin vs. chuck), grass-fed, and organic leading the authors to conclude that local small- and medium-scale producers may need to reconsider switching from conventional to organic or grass-fed meat production since price premiums can be minimal.

Altruism Influences on Natural and Regionally Produced

Umberger *et al.* (2009) also conducted a study looking at how altruism influences U.S. consumer preferences and WTP for natural and regionally produced beef. From a national online survey, an attempt was made to identify factors explaining consumers' WTP higher premiums for natural and regionally produced ground beef and USDA Choice rib-eye steaks. According to the authors, consumer preferences were motivated by a combination of perceptions of personal benefits and altruistic factors. The study's purpose was to investigate the relationship between altruism versus other factors determining meat purchasing behavior by consumers related to a specific meat attribute. Increased disposable incomes, food safety issues, and environmental concerns are some of the causal factors influencing consumers' particularities of meat production processes. Socio-demographic factors positively influencing WTP a premium for regionally produced, natural beef include young consumers,

no children living at home, and high incomes. A negative factor included the importance of price in their purchasing decision. Altruistic factors positively influencing consumers' WTP a higher premium included perceptions that natural beef was safer than conventional beef; quality, nutrition, and safety perceptions of natural beef; humane treatment of animals; concerns about antibiotic and hormone usage in production; and support for local agriculture.

Humane Treatment

Humane treatment and interest in farm animals well-being was a concern to Ohioans in a survey conducted by Ohio State University in 2004 (Rauch and Sharp, 2005). For those responding (note only four percent resided on a farm), 92 percent agreed it was important that animals on farms are well-cared for, 85 percent agreed that even though some farm animals are used for meat, the quality of their lives is important, 81 percent agreed that the well-being of farm animals are just as important as the well-being of pets, and 75 percent agreed that farm animals should be protected from feeling physical pain. In addition, 59 percent of the respondents were WTP more for meat, poultry, or dairy labeled for animals that were humanely treated. Of that group, 12.4 percent were WTP 25 percent more, 43.1 percent were WTP 10 percent more, and 40.6 percent were not WTP more. In the 2008 follow-up Ohio survey, 56 percent of the respondents agreed that increased regulation of the treatment of farm animals is needed, a 19.1 percent increase from 2004 survey data (Rauch and Sharp, 2005; Sharp, 2008).

Of interest would be the growth rates of the various differentiated meat products discussed. Except for the organic foods industry, much of this data is either lacking or discussed only peripherally. According to Painter (2008) in 2003, the growth rate for organic meat was 78 percent with an expected growth rate of 43 percent through 2008. Greene et al. (2009) noted that between 1997 and 2008, organic food sales increased annually between 12 and 21 percent, and of the organic sales made in 2004, 24 percent were made locally. Allan (2002) noted that in 1998 of the total market share of U.S. beef, 10 to 12 percent were accounted for by producer and processor brands with expectations to be

25-30 percent by the end of 2002. Assuming a conservative 10 percent market share in organic beef and 58.1 pounds per capita beef consumption per person in 2009, 5.8 pounds per capita of organic beef are consumed per year. Adjusting population for individuals less than five years of age, 5.94 million individuals live in Tennessee (Census, 2010). Organic beef consumption based on this logic was estimated at 34.4 million pounds for the state.

Targeted Consumer Profile for Tennessee

For the studies previously discussed, the socio-demographics of the “targeted consumer” for the meat attribute products discussed appear, in general, to be young, female, educated, and have high incomes. Household size may positively or negatively influence preferences (see Evans, 2007 and Umberger *et al.*, 2009). For Tennessee, the median age for females is 37.2, average female proportion is 51.3 percent, individuals holding a bachelor’s degree or higher is 22.7 percent, persons per household is 2.49, and the average median household income is \$43,314 (Census Bureau, 2010; IDcide, 2010). The maps in Figures 4 through 9 detail these socio-demographic characteristics spatially by county for the

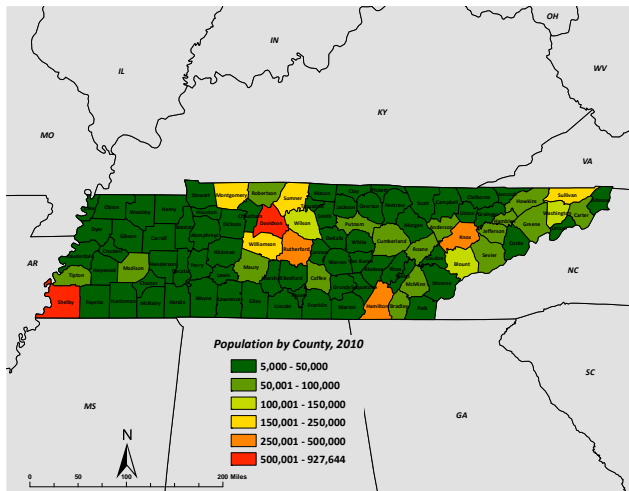


Figure 4. Population by County, 2010

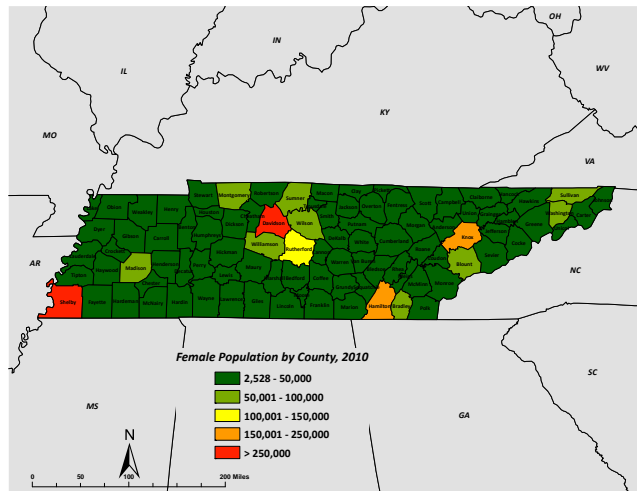


Figure 5. Female Population by County, 2010

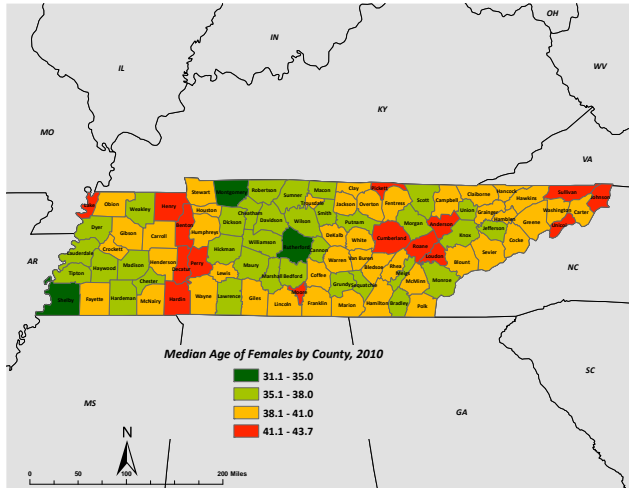


Figure 6. Median Age of Females by County, 2010

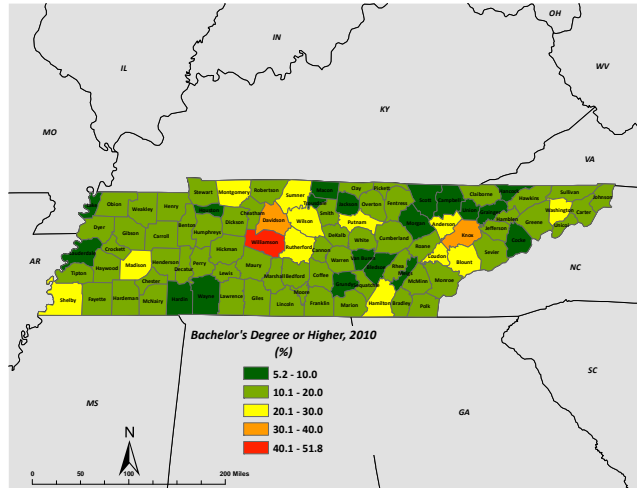


Figure 7. Persons with Bachelor's Degree or Higher by County, 2010

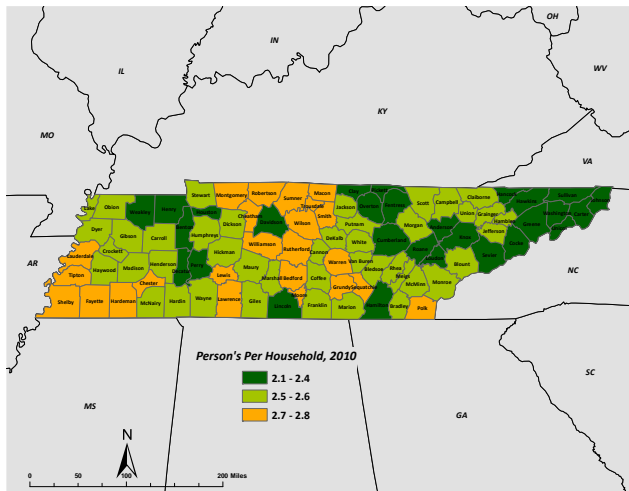


Figure 8. Person Per Household by County, 2010

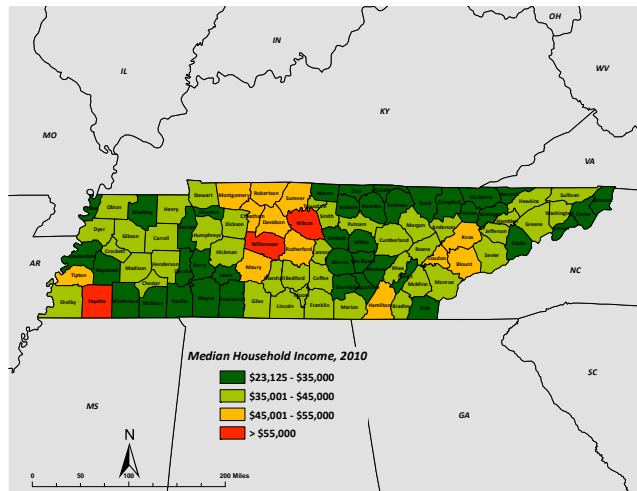


Figure 9. Median Household Income by County, 2010

Source: U.S. Census Bureau, 2010

state. The counties most closely matching the socio-demographics for the “targeted consumer” profile are shown in Figure 10. For this study, a small household size is assumed to positively influence preferences for meat attribute products. Davidson County matches all five of the socio-demographics characterized for the “targeted consumer”, whereas Shelby, Hamilton, and Knox Counties match four of the five socio-demographics characterized.

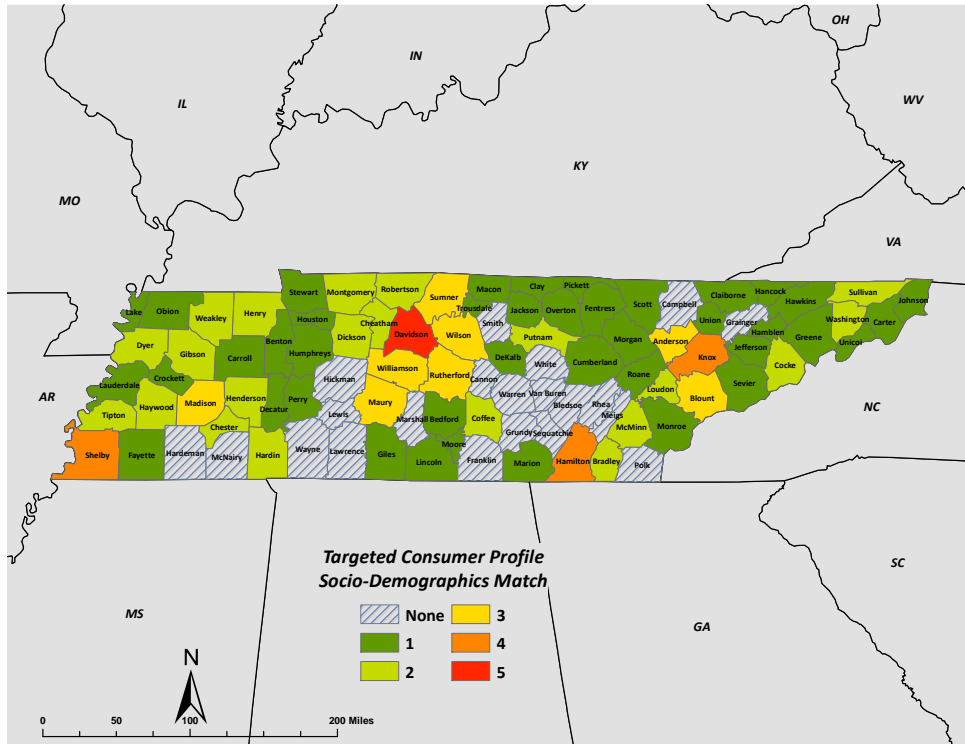


Figure 10. Counties Matching the “Targeted Consumer” Profile Socio-Demographics, 2010

Tennessee USDA Meat Slaughtering Facilities

Should producers desire to increase direct and local sales of meat products by focusing on consumers’ demand for differentiated meat product attributes, a discussion of meat slaughtering facilities in the state is warranted. Using USDA’s Food Safety and Inspection Service (FSIS) database, the locations of slaughtering/processing facilities contacted in Tennessee are revealed in Figure 11. In addition to slaughtering meat for resale, some of the facilities shown on the map may also slaughter for personal use (custom). In May 2012, facility representatives were telephoned to verify they were indeed a USDA inspected slaughtering facility, what kinds of livestock the facility was USDA approved to slaughter, and quantities of livestock slaughtered. These same questions were asked if the facility provided custom slaughtering too. Also asked was if the facility slaughtered for individual producers interested in marketing their own meat products (Table 2). Of the original 31 facilities that offer USDA slaughter/processing services, 19 responded to the telephone survey (5 no longer slaughtered any

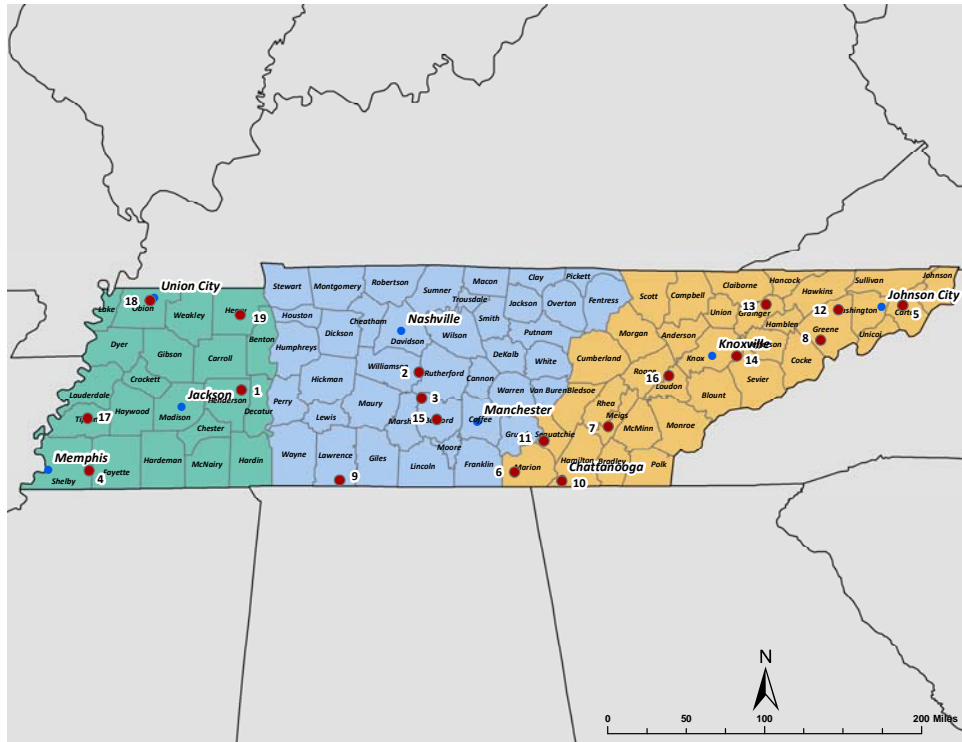


Figure 11. Location of USDA Inspected Slaughtering Facilities in Tennessee, 2012
 Source: USDA/FSIS, 2012

Table 2. Tennessee’s USDA Inspected Slaughtering Facilities Contacted, 2012

Facility ID	Company/Address	County	USDA Inspected	Custom
1	412 Meat Processing Inc. 19690 Highway 412 E. Lexington, TN 38351 (West)	Henderson	Yes	Yes
2	C & F Meats 5247 Murfreesboro Road College Grove, TN 37046 (Middle)	Williamson	Yes	Yes
3	Cattleman’s Custom Processing 2830 Ezell Road Chapel Hill, TN 37034 (Middle)	Marshall	Yes	Yes
4	Fayette Packing Co., Inc. 16620 Highway 196 Eads, TN 38028 (West)	Fayette	Yes	Yes
5	H & H Meats 106 Nave Hollow Loop Elizabethton, TN 37643 (East)	Carter	Yes	Yes
6	H & P Meats 2421 Highway 156 South Pittsburgh, TN 37380 (East)	Marion	Yes	No

Table 2. Tennessee's USDA Inspected Slaughtering Facilities Contacted, 2012

Facility ID	Company/Address	County	USDA Inspected	Custom
7	Hampton Meat Processing 216 Breeden Drive Decatur, TN 37322 (East)	Meigs	Yes	Yes
8	Harris Country Meats 480 Twin Barnes Road Greenville, TN 37743 (East)	Greene	Yes	Yes
9	J.C. Peters & Sons 953 Lexington Highway Loretto, TN 38469 (Middle)	Lawrence	Yes	Yes
10	Pilgrim's Pride Corporation 414 W. 16 th Street Chattanooga, TN 37408 (East)	Hamilton	Yes	No
11	R & D Custom Slaughtering 27015 US 127 Dunlap, TN 37327 (East)	Sequatchie	Yes	Yes
12	Snapps Ferry Packing Co. 5900 East Andrew Johnson Hwy. Afton, TN 37616 (East)	Greene	Yes	Yes
13	Southeastern Provision LLC 1617 Helton Road Bean Station, TN 37708 (East)	Grainger	Yes	No
14	Swaggerty Sausage Co., Inc. 2827 Swaggerty Road Kodak, TN 37764 (East)	Sevier	Yes	No
15	Tyson Foods Inc. 901 W. Jackson Shelbyville, TN 37160 (Middle)	Bedford	Yes	No
16	Wamplers Farm Sausage 781 Highway 70 W Lenoir City, TN 37771 (East)	Loudon	Yes	No
17	Wells Processing Plant 711 East Woodlawn Ave. Brighton, TN 38011 (West)	Tipton	Yes	No
18	Williams Sausage Co., Inc. 5132 Old Troy Hickman Rd. Union City, TN 38261 (West)	Obion	Yes	No
19	Yoder Brothers Meat Processing 1650 Briarpatch Rd. Paris, TN 38242 (West)	Henry	Yes	Yes

Source: USDA/FSIS, 2012

animals; 7 could not be contacted). Ten of the facilities contacted were located in East Tennessee, four in Middle Tennessee, and five in West Tennessee.

For USDA inspected slaughters from the telephone survey, poultry was the largest number of animals slaughtered at 123.5 million followed by hogs (235,492), goats (48,583), cattle (43,924), sheep (21,544), and other (deer, bison, beefalo, and elk) (11) (Table 3). For custom slaughtering, the greatest number of animals slaughtered was cattle (5,595), hogs (3,650), other (606), sheep (96), and goats (78). USDA inspected slaughter facilities in the East Region slaughtered greater numbers of cattle (41,760) and hogs (165,880) compared to the other two regions in the state. Poultry slaughtered numbers (62.4 million) was greatest in the Middle Region, followed by the East Region (61.1 million). Goat (42,824) and sheep (19,460) slaughtered numbers were greater in the West Region. Ten of the 19 facilities contacted slaughter for individual producers (a total of 92 producers across the state) that plan to market their own meat products. Approximately 52 of these producers were located in the East Region of the state, 14 in the Middle Region, and 26 in the Western.

Table 3. Number and Types of Animals Slaughtered by Region by Tennessee’s USDA Inspected Facilities Contacted, 2012.

Region	Animal Types and Number Slaughtered*											
	Cattle		Hogs		Goats		Sheep		Poultry		Other**	
East	41,760	2,933	165,880	1,534	4,717	24	1,042	40	61,100,000	0	3	603
Middle	458	876	2,612	1,292	1,042	49	1,042	51	62,400,000	0	8	3
West	1,706	1,786	67,000	824	42,824	5	19,460	5	7,800	0	0	0
Total	43,924	5,595	235,492	3,650	48,583	78	21,544	96	123,507,800	0	11	606
Average	3,379	509	15,699	332	4,417	10	1,959	12	41,169,267	0	5.5	151.5

*Highlighted values are for USDA inspected slaughtering/processing; non-highlighted values are for custom exempt

**Other-deer, bison, beefalo, and elk

Source: USDA/FSIS, 2012

Lack of available slaughtering facilities, existing slaughter facilities not operating at capacity, and length of time waiting for services are just a few of the issues producers face when it comes to meat slaughtering and processing. Some states have investigated the feasibility of an USDA inspected mobile slaughtering unit to circumvent some of these issues but the expense and volume of animals required to justify investing and operating the mobile unit needs careful evaluation (Gardner, 2009; Yorgey, 2008).

Direct-to-Consumer Sales

According to the 2007 Census of Agriculture for Tennessee, 3,581 farms (4.5 percent of total farms) had direct-to-consumer sales⁷ of agricultural products for human consumption totaling \$15.4 million (0.6 percent of total agricultural products sold). For agricultural products sold sales in 2007, this represents a 37 percent increase from 2002 level of \$11.2 million. Of the state's totals, beef cattle ranching and farming (NAICS 112111) represents 47.4 percent of the total number of farms and 47.4 percent of total agricultural products sold. Nationally, direct-to-consumer sales increased 49 percent from 2002 to 2007 and accounted for six percent of all farms and 0.4 percent of all agricultural sales (USDA/NASS, 2007). Figures 12 and 13 details direct-to-consumer sales information for Tennessee at the county level. The number of farms selling agricultural products directly to individuals for consumption is greater in the middle and eastern region of the state. Likewise, this holds true for volume of sales with the eastern region of the state showing greater activity.

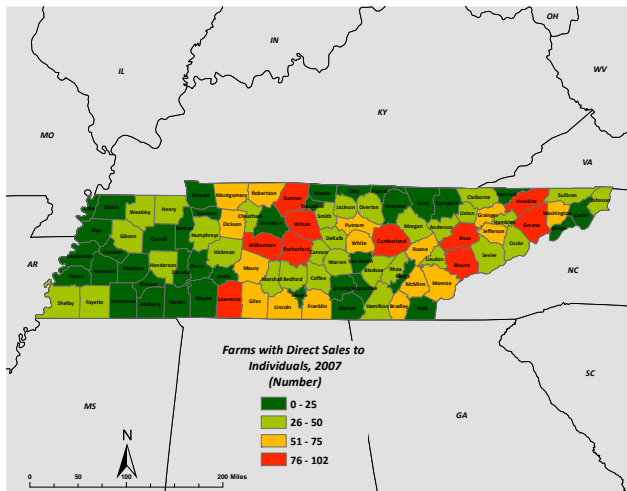


Figure 12. Number of Farms Selling Agricultural Products Directly to Individuals for Consumption by County, 2007

Source: USDA/NASS, 2007

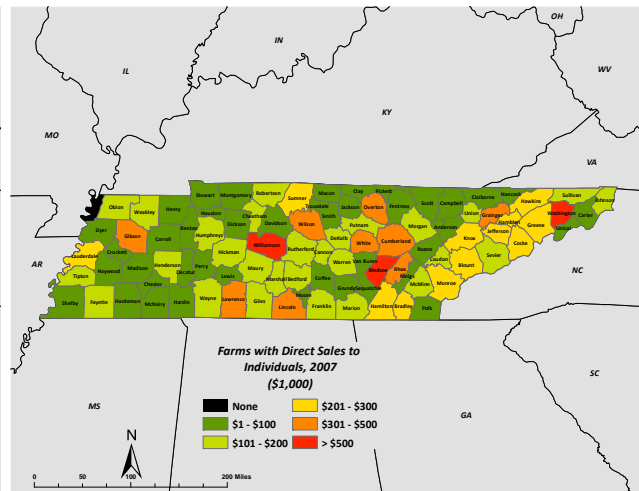


Figure 13. Volume of Sales for Agricultural Products Sold Directly to Individuals for Consumption by County, 2007

⁷ According to the Ag Census, represents the value of agricultural products produced and sold directly to individuals for human consumption from roadside stands, farmers' markets, pick-your-own sites, etc. It excludes non-edible products such as nursery crops, cut flowers, and wool but includes livestock sales. Sales of agricultural products by vertically integrated operations through their own processing and marketing operations were excluded (USDA/NASS, 2007).

Based on beef margin values presented in Table 4, from 2006 to 2011 the average wholesale to retail price spread was 194.1 cents per pound. For those producers involved in direct-to-consumer sales, this price spread margin would potentially shift to their operations. Table 5 lists the names of Tennessee producers with working internet links selling a differentiated beef attribute product directly to consumers as of June 15, 2012. Rib-eye steak and ground beef were two representative meat products chosen. For rib- eye steak, prices ranged from \$10.99 to \$22.50 per pound with the average being \$17.36 per pound. Likewise, for ground beef, prices ranged from \$5.00 to \$9.60 per pound with

Table 4. Annual Averages of Choice Beef Values				
Year	Retail Value	Wholesale Value	Gross Farm Value	Wholesale to Retail Price Spread
Cents Per Pound of Retail Equivalent				
2006	397.0	228.0	206.6	169.0
2007	415.8	231.0	222.6	184.8
2008	432.5	234.7	223.2	197.8
2009	426.0	217.2	200.4	208.8
2010	439.5	241.1	230.8	197.4
2011	482.7	275.7	274.8	207.0

Source: USDA/ERS, 2012

Table 5. Prices of Rib-Eye and Ground Beef Sold Directly to Consumers by Tennessee Producers Marketing a Differentiated Beef Product Attribute			
Producer	Differentiated Meat "Niche"	Rib-Eye¹	Ground Beef¹
Baggett Family Farm Clarksville, TN 37043	Producer & seller of grass-fed beef	\$14.00/12 ounces	\$6.00/pound
Circle J Ranch Indian Mound, TN 37079	Pasture/hay feed & receive 30-60 days of grain feed prior to processing	\$10.99/pound	\$5.99/pound
Circle T Farm Columbia, TN 38401	No added hormones; natural feed; pasture raised	\$16.00/pound	\$6.00/pound
Gourmet Pasture Beef, LLC Springfield, TN 37172	TN grown grass-fed beef; dry-aged,	\$14.99/12 ounces	\$5.99/pound
Homestead Beef Sale Creek, TN 37373	TN grown Limousin beef; animals born/raised on farm; no antibiotics or added hormones; all natural; pasture raised & vegetarian fed; USDA processed	\$21.60/pound	\$9.60/pound
KLD Farm LLC Ashland City, TN 37015	Local farm raised all natural angus beef; grass-fed & grain finished; no antibiotics or growth hormones; USDA inspected retail cuts; minimally processed & dry-aged	\$17.00/pound	\$6.25/pound
Meadow Branch Beef Morrison, TN 37357	Grass-fed, all natural, locally grown; dry-aged; raised without growth hormones or antibiotics	\$11.90/.80-.89 pound	\$5.50/pound

Table 5. Prices of Rib-Eye and Ground Beef Sold Directly to Consumers by Tennessee Producers Marketing a Differentiated Beef Product Attribute

Producer	Differentiated Meat “Niche”	Rib-Eye ¹	Ground Beef ¹
Peaceful Pastures Hickman, TN 38567	All natural, grass-fed, no confinement; offers on farm community supported agriculture		\$5.25/pound
Red Hill Farms Lafayette, TN 37083	USDA inspected; no antibiotics; no animal by-products fed; no added hormones or steroids	\$15.00/pound	\$5.00/pound
TN Valley Farms Knoxville, TN 37950	100% grass-fed black angus beef; no antibiotics or added hormones; animals raised under humane, natural conditions & using only low stress management techniques; practice sustainable agriculture	\$18.00/pound	\$6.50/pound
Triple L Ranch Franklin, TN 37064	Natural beef; sustainable agriculture; naturally raised; dry-aged	\$18.00/pound	\$6.00/pound
Walnut Hills Farm Bethpage, TN 37022	Natural, dry-aged beef; no growth hormones or antibiotics; no herbicides or pesticides on pasture	\$22.50/pound	\$6.00- \$6.68/pound
West Wind Farms Meat & Poultry Deer Lodge, TN 37726	Certified organic and grass-fed meats & poultry	<i>a</i>	<i>a</i>

¹Prices as of June 15, 2012

^aProducts available but currently sold out; prices not given.

Source: Tennessee Department of Agriculture, 2012.

the average being \$6.20 per pound. In comparison, according to USDA’s advertised prices for beef to consumers in the southeast at major retail supermarket outlets for the period June 15 through June 21, 2012, the weighted average prices for bone-in and boneless rib-eye steak were \$6.27 and \$9.20, respectively. For bone-in rib eye steaks, prices ranged from \$5.99 to \$7.99 per pound; for boneless rib eye steaks, prices ranged from \$7.97 to \$9.98 per pound. For this same timeframe for ground beef (90 percent or more lean), the weighted average price was \$4.92 per pound with prices ranging from \$4.50 to \$5.99 per pound (USDA/AMS, 2012).

Tennessee Meat Producers’ Implications

From the previous discussions, the question becomes what are the implications for meat producers in Tennessee if the traditional commodity-oriented marketing approach for meat may be progressing to a more consumer-oriented market where consumers are WTP more for differentiated meat product segment attributes—a critical issue justifying this transition. If meat producers change

current production methods to a single or a bundle of these following attributes – grass-fed, environmentally friendly, organic, hormone and antibiotics free, traceable, branded, locally produced, natural, or humanely treated – they need to address what production techniques do they have to control to achieve this objective (e.g., genetics (favor a trait that reduces per unit production costs or promotes per unit production revenue), breed choices, feed ingredients, and/or traceability)? If an economic incentive exists, for example, for the elimination of growth hormones or antibiotics, or for adopting a more labor intensive farming system that adopts one or a bundle of these meat production attributes, then changing production methods may be justified (Boland and Schroder, 2000).

Based on the willingness-to-pay studies reviewed in this analysis, the “targeted consumer” profile appears to be individuals who are young, female, educated, have high incomes, and have small household sizes. Based on these socio-demographics, Davidson County and the surrounding middle Tennessee counties of Maury, Robertson, Rutherford, Williamson, and Wilson, plus the east Tennessee counties Anderson, Blount, and Knox, have market “niches” for this consumer profile type willing-to-pay a premium for differentiated beef product segments. Depending on the type and how the differentiated beef product segment was marketed in the studies reviewed, for those consumers’ willing-to-pay a premium, the premiums ranged from \$1.00 to \$2.56 per pound more. For Tennessee producers’, the question becomes whether the premium is large enough and/or sustainable over a period of time to justify transitioning and/or diversifying from traditional beef production methods to production methods that embraces a differentiated beef product attribute or a bundle of attributes.

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