Attributes Preferred and Premiums Offered for Naturally Produced Beef Cattle

Job D. Springer, Jon T. Biermacher, M.D. Childs, Deke O. Alkire, and Brandon Grooms

Job D. Springer is an agricultural economist and consultant, Jon T. Biermacher is a research economist, M.D. Childs is an agricultural economist and senior consultant, Deke O. Alkire is an animal scientist and consultant with the Samuel Roberts Noble Foundation, Ardmore, Oklahoma. Brandon Grooms is a credit officer with Ag Texas Credit Services, Stephenville, Texas. Noble Foundation professional paper NF-AG151.

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Contact author:
Jon T. Biermacher
The Samuel Roberts Noble Foundation, Inc.
2510 Sam Noble Parkway
Ardmore, OK 73401
Phone: (580) 224-6410
e-mail: jtbiermacher@noble.org

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Abstract

A growing number of beef cattle producers in the US are using limited information to determine whether or not it would be economical for them to grow naturally produced cattle. The objective was to discover the attributes that marketing companies prefer for the naturally produced cattle they purchase, and to elicit the price premiums being offered for cattle that possess these attributes. Results of a phone survey of companies that purchase natural cattle show that 27 out of 32 companies report their willingness to pay a premium of $5.95/cwt for cattle that have never received antibiotics, ionophores, hormones or animal by-products.

Key words: attributes, beef, cattle, naturally produced, premiums

Introduction

Over the past several years, consumer expenditures for food products that have been labeled and sold as "naturally produced" and/or "organically produced" has increased substantially. Retail sales of organically produced food products increased from $3.6 billion in 1997 to $16.7 billion in 2006, or by 365% during those years (Organic Trade Commission). Much of this increase in expenditures is the result of two primary factors including, (1) a perceived benefit of natural and organic foods, and (2) growing trends in consumers' personal incomes. Although much of the increase in expenditures has been for fruits and vegetables, naturally and organically produced meat products have also been gaining popularity with consumers. As an example, popular restaurant chains such as Chipotle Mexican Grill and Good Time Burgers are now serving only naturally produced beef, chicken and pork items in their restaurants. The demand for naturally produced meat is expected to grow in tandem with the growth in a wealthier and more knowledgeable consumer base, providing for an increase in opportunities for cattle producers to capitalize on this growing market.

One issue that is hindering the development of the naturally produced beef industry is the inconsistency regarding what constitutes a formal definition of “naturally produced” beef. At this time, the USDA does not have a standardized definition for naturally produced beef nor has the agency developed a program with clearly established guidelines and regulations for beef products that have been labeled as naturally produced. Despite the lack of an official program, several companies such as Meyer, National Beef and Creekstone have been responding to growing consumer demand by marketing beef labeled as “naturally produced.” The key to these companies’ success has relied on their ability to acquire cattle from livestock producers that possess certain attributes that meet their standards as defined by their respective labels on the beef products they sell.

In response to this growing demand, an increasing number of beef cattle producers have expressed an interest in understanding more about this emerging market and are currently trying to decide whether or not it would be economically feasible for them to grow naturally produced cattle. At this time, though, producers do not have sufficient information regarding the preferred attributes for naturally produced cattle that marketing companies are seeking to purchase nor do they have sufficient information about the premiums these companies are willing to pay to acquire cattle with these attributes. Our research seeks to discover the specific attributes that marketing companies prefer for the naturally produced cattle they purchase, and to elicit the price premiums that these companies are willing to pay for cattle that have the preferred attributes.

The information provided in this paper is expected to help beef cattle producers determine whether or not they should consider growing naturally produced cattle. Also, it is expected that the information gleaned from this research will be useful to beef and forage production scientists who are interested in developing best management practices for growing cattle under a naturally produced system. Further, this information will benefit extension and outreach specialists as they develop educational programs that are geared to inform beef cattle producers about the potential benefits and practices associated with the naturally produced beef industry.

In the next section of the paper, the procedures used for developing and implementing the phone survey to the marketing companies that purchase naturally produced cattle from producers is provided. We then report the findings of the survey and their implications for livestock producers. Lastly, we provide a summary with final conclusions, including limitations of the study.

Survey Method and Procedures

For this study we elected to utilize a phone survey to illicit information from marketing companies that purchase naturally produced cattle for several reasons. First, costly transportation expenses prohibited us from surveying these marketing companies in person. Second, given that this was not an expected event for these marketing companies, we felt that an initial phone call prior to a survey would improve our chances of a high response rate. Often times, mail out surveys result in small response rates (Oppenheim). Although this is typically acceptable when you have a large sample size, it may prove to be inefficient with a small group of potential participants being contacted and queried for the first time. Finally, the phone survey allows for more direct control of the interview process and allows for a set of immediate follow up questions "closed form" questions (e.g., answer is either yes or no) (Oppenheim).

There were several steps associated with the development and the implementation of the phone survey. The first step was to identify a viable sample of companies that are engaged in purchasing naturally produced beef cattle from farmers and ranchers. An internet search combined with information obtained from industry experts at the Noble Foundation, Oklahoma State University, Cattle Fax and the Livestock Marketing Information Council (LMIC) were used to determine companies that currently purchase naturally produced cattle in the United States. Our initial goal was to identify a sample of marketing companies that were buying naturally produced cattle from farmers and ranchers. However, our search efforts captured the majority of the population of companies who currently purchase naturally produced cattle. In total, we identified thirty-two companies (23 marketing companies and 9 feed yards) that purchase naturally produced beef cattle from ranchers in the US. Although other companies that purchase naturally raised cattle likely exists in the US, we feel that these companies are few and do not represent a large share of this particular market.

The second step was to identify questions to ask the survey participants. It was important to address the most important issues related to both production and economic issues regarding naturally produced cattle. An initial set of closed ended questions (i.e., answered either yes or no) were developed for four primary areas of information, including: (1) company description, (2) cattle management practices, (3) cattle quality preferences, and (4) cattle marketing. The initial set of closed form survey questions are reported in Table 1. A limited set of questions were developed in order to get a basic understanding about the companies that purchase naturally produced cattle, including the type of business they are (i.e., marketing company or a feedyard) and the type of cattle they prefer to purchase (i.e., feeder cattle or slaughter cattle).

Specific questions related to how cattle are managed were developed to clarify acceptable and desired management practices used in the production of natural cattle. These questions addressed commonly accepted best management practices in a typical production system. A brief explanation is provided for those questions that may be ambiguous.

There are four inputs used in the livestock production system (including the production of beef cattle) in the United States that have drawn substantial public debate over the past few years. They include the use of antibiotics, ionophores, hormones and by-product feeds. The growing debate about the safety of these inputs regarding consumer health has lead to growing demand for meat products labeled as “naturally produced” or “antibiotic and hormone free” (Lusk et al.). For this survey, the use of antibiotics was separated into two questions: “Do you have restrictions on the use of antibiotics?” and “Do you have restrictions on the use of ionophores?” This separation is important because ionophores are in fact classified as antibiotics; however it has been shown that their use will not contribute to the occurrence of antibiotic resistance (Callaway et. al, 2003). Also, it is important to discover whether or not the companies who purchase naturally produce cattle place restrictions on cattle that have been administered hormones or have been given animal by-products in their diets. This is important as public perception responding to reports about the possible healthcare associated with these inputs have resulted in proposals to fully eliminate the use of antibiotics and hormones in agriculture (Lusk et al.).

A question was developed regarding the preference for cattle that have been tested for a persistent infection of bovine viral diarrhea virus (BVDV). BVDV infection can result in many disease conditions in cattle, including respiratory disease and a subsequent decrease in performance (Larson et. al, 2002). Calves that are persistently infected (PI) with BVDV shed the virus, potentially infecting animals that are exposed to the PI animal. However, there is conflicting research on the effects of exposure to PI calves on feedlot performance (Elam et. al, 2008).

Several questions regarding the preferences for cattle quality were developed. It was deemed important to understand what restrictions buyers of naturally produced cattle placed on various aspects of cattle quality, including age, quality grade, hide color and genetics.

Cattle marketing questions were developed to ascertain various preferences for processing and feeding locations, payments for shipping and shrinkage, and of course to determine information bout premiums offered for naturally produced cattle.

In total there were twenty-seven questions asked to those surveyed. Questions were first asked in a “closed survey” format (seen in Table 1) with answers being either “yes” or “no.” When the response to a question was “yes” then more detail was asked in order to glean additional information about the preferences for particular attributes for naturally produced cattle.

In order to standardize quoted premiums based on live cattle weights and carcass weights, premiums that were quoted on a carcass weight basis were converted to a live weight basis as follows:

(1) $$[(\alpha * \beta) * \gamma] = \delta$$

where α is defined as dressing percentage, β is the dollar premium per cwt of carcass, γ is carcass weight in lbs, and δ is the dollar premium per cwt of live weight. The industry average of 63.5% was used for dressing percentage (Gardner).

In order to categorize feed yard and processor plant locations, we subdivided the United States into the following four geographical regions (see Figure 1.): (1) North Central Plains, (2) South Central Plains, (3) East Coast, and (4) West Coast.

The survey results were then categorized across respondents according to the answers provided during the phone interview. Categorical responses to the survey questions were analyzed using statistical procedures in SAS®.

The survey was administered the same for each of the 32 respondents who opted to respond to our questions. Each of the 32 calls contained the components developed by Saris. First, we introduced our organization and its mission and provided some detail about the specific goals of the survey. In an attempt to motive participation in our survey, we then made a case to our potential respondent that information obtained from the survey would be valuable to both farm producers and to individual marketing companies interested in purchasing naturally produced cattle. Once a company agreed to participate in the survey further details regarding the contents of the survey, including definitions for the specific terminology used in the survey and a detailed explanation of the instructions for how the interview would proceed were provided. We then administered the interview, and then ended the process by providing our gratitude to each of the respondents for their willingness to participate.

Results and Discussion

Responses to the closed form survey questions for the four categories of information are reported in Table 2 and results associated with follow up questions for the type of business section of questions are reported in Table 3. We found that 23 out of the 32 companies (72%)

surveyed were classified as a natural beef marketing company. The other 28% of the companies that purchase naturally produced cattle are classified as feed yards. The results also show that forty-four percent (14 out of 32 companies) of the businesses we interviewed were interested in purchasing naturally raised feeder calves. Eighty-five percent (12 of those 14) wanting to purchase feeder cattle preferred cattle that weighed at least 600 pounds (see Table 3). In addition, 72% (23 / 32) of the businesses surveyed were interested in purchasing cattle at the point of finishing. Of these entities, 63% (14 / 23) wanted cattle that weighed at least 1,200 pounds. According to USDA—NASS the average federally inspected live finishing weight for beef cattle between January and November of 2008 was 1,282 pounds. These results suggest that natural cattle finish at lighter weights than conventional cattle.

Categorical responses to follow up questions regarding restrictions on antibiotics, ionophores, hormones and by-product feeds are reported in Table 4. We found that 84% (26 / 31) of the companies with restrictions on the use of antibiotics prefer natural cattle that have never received any type of antibiotic. In contrast, we discovered that 94% (30 / 32) had no restrictions on fly control, suggesting that marketing companies are more concerned about antibiotic use than other chemical residues. It is interesting to note that 97% (31 / 32) of those surveyed said they had no restrictions on mineral supplements even though there are many mineral supplements available that contain antibiotics. Numerically, there were more businesses that had restrictions on antibiotics (97%) (31 / 32) than ionophores (94%) (30 / 32).

Responses to follow up questions regarding restrictions on humane treatment of animals, source verification, vaccinations, and fly control are reported in Table 5. When asked if verification was required for source verified cattle, 22% (7 /32) of the respondents said they did not, which may imply that they will not be marketing naturally produced cattle based on this trait. These findings could suggest that the other 78% (25 /32) of companies may be supplying naturally produced beef to international markets. Humane treatment of the cattle was a requirement for 84% (27 / 32) of the businesses surveyed. However, when further queried, 63% (17 / 32) of these companies reported that common treatment (regular cattle industry practices) was preferred. Results related to source and age verification were mixed. When asked, 84% (27 / 32) of those surveyed did have some restrictions on slaughter age, of those with restrictions 88% (21 / 32) required third party age verification. This could suggest that cattle age was determined from the carcass and therefore producer records were not needed.

Categorical responses to follow up questions regarding preferences for naturally produced cattle that have restrictions for quality grade, dairy cattle and Brahman influence are reported in Table 6. Most businesses (78%) (25 / 32) had an established target for quality grade. Sixty-eight percent (17 / 25) required mainly choice cattle, while 44% (14 / 32) required cattle they purchased be Angus or black hided. Of those companies requiring mainly choice cattle, 79% (13 / 17) also required that cattle be Angus or black hided. This suggests that these businesses perceive Angus and black hided cattle to predominately grade choice. Incidentally, only 8% (2 / 25) of the companies were interested in purchasing cattle that were expected to grade Select or less. There were also businesses that placed restrictions on cattle with dairy and Brahman influence amounting to 19% (6 / 32) and 72% (23/ 32) respectively. These companies are perhaps unwilling to buy predominately Brahman or dairy influence cattle because of their inability to reach a high quality grade regularly and poor feed efficiency respectively.

Table 7 provides the responses to the follow up questions regarding the restrictions that respondents placed on slaughter age verification. Out of the 24 respondents who said they did require some type of verification for the age of the cattle they purchase, 88% said they require

USDA third party verification. In addition, 27 of the 32 respondents said that they did have some requirements for slaughter age. In fact, 26% (7 companies) require the cattle they purchase to be less than 21 months of age at the time they are slaughtered.

Categorical responses to follow up questions regarding location preferences for feeding, processing and burden of shipping payment are reported in Table 8. The results show that nine percent (3 / 32) of the businesses reported that they pay for shipping of the cattle they purchase while 53% tend to negotiate shipping on a case by case basis. When determining delivery points, our survey showed that the north central plains (Figure 1) is where the largest percentage of feed yards and processing plants are located for naturally produced cattle. Of those queried 84% (27 / 32) said they purchased mixed sex loads.

Responses to the follow up questions regarding preferences for shrinkage, purchase agreement verification, information used to form a base price and price premiums offered for naturally produced cattle are reported in Table 9. The results show that 56% (18 /32) figured a shrink on the cattle before purchase. The most common response for the percentage shrink used to calculate pay weight by the businesses was three to four percent. When asked how a base price was formulated for the naturally produced cattle, 44% (14 /32) of the companies reported that they use a USDA report while only nine percent (3 / 32) used information from the Chicago Mercantile Exchange. We discovered that 84% (27 / 32) of the companies surveyed were willing to pay a premium to cattle producers for naturally produced cattle. This premium ranged from $0.25 per cwt to $15.75 per cwt. Of those who reported a willingness to pay a premium, the average amount offered was $6.51 per cwt. On average, marketing companies reported that they were willing to pay $5.79 per cwt while feed yards were willing to pay $4.76 per cwt.

The number of respondents and corresponding premiums varied by cattle attribute or by combinations of attributes. For example, there were 25 marketing companies that responded that they were willing to pay an average premium of $5.95 per cwt for “never ever” cattle; that is, cattle that have never received any form of antibiotics, ionophores, hormones, or animal by-products.

With these restrictions and requiring Angus or black hided cattle, no dairy influence and less than twenty-five percent Brahman influence, there were two businesses that offered a premium of $9.13 per cwt.

Conclusions and Limitations

Our results show that the premiums offered by companies for naturally produced cattle vary substantially, as do the attributes. This variation is likely due to the absence of an official, standardized definition for cattle that are “naturally produced.” Although the attributes required and premiums provided by the businesses vary in the survey, our results do provide a guideline to follow for future production decisions, research strategies and education seminars.

A limitation of this study is a lack of appropriate data that can be used to separate the value of the premiums into specific attribute categories. A follow up mail survey could be developed to address this issue. In addition, future research needs to be conducted in order to determine the cost of producing cattle that meets these desired attributes specified by the marketing companies surveyed in this study. These costs would be needed to compare whether or not a producer should consider adopting a naturally produced process on their farm.

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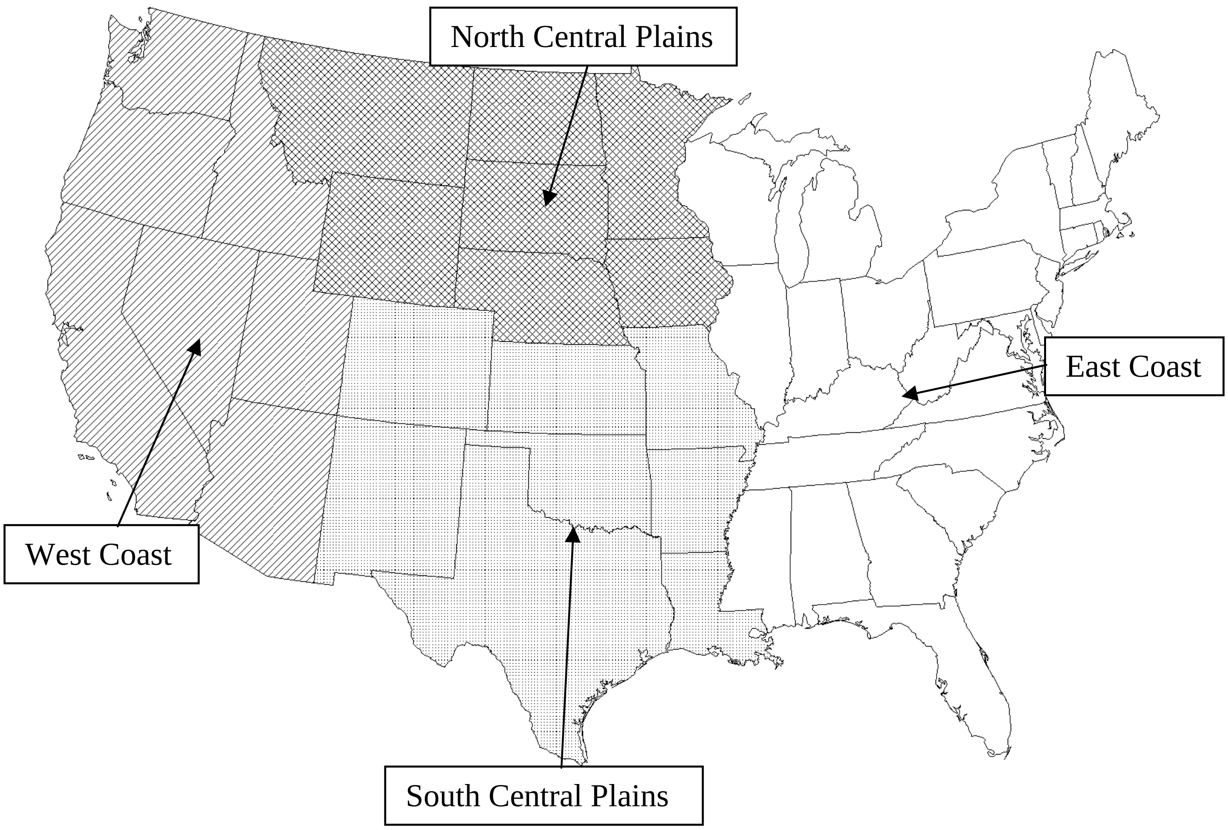

Figure 1. Map of the lower 48 states of the United States broken into four geographic regions to categorize natural feed yard and processor plant locations.

Table 1. Closed form survey questions for 4 individual categories of information, including general business information, cattle management preferrences, cattle quality preferences, and cattle marketing preferences

General Business Information:
Are you a natural beef marketing company?
Do you offer cattle producers a premium for natural cattle?
Do you purchase feeder cattle from cattle producers?
Do you purchase finished cattle from cattle producers?

Cattle Management Preferences:
Do you have restrictions on the use of antibiotics?
Do you have restrictions on the use of ionophores?
Do you have restrictions on the use of hormones?
Do you have restrictions on the use of animal by products?
Do you have restrictions on the use of mineral supplements?
Do you have requirements for humane treatment?
Do you require verification for source verified cattle?
Do you have restrictions regarding vaccinations?
Do you have restrictions on the use of fly control?
Do you prefer persistently infected (PI) tested cattle?

Cattle Quality Preferences:
Do you require verification for age verified cattle?
Do you have a targeted quality grade?
Do you have requirements on slaughter age?
Do you require angus or black hided cattle?
Do you have restrictions on dairy cattle?
Do you have restrictions on Brahman cattle?

Cattle Marketing Preferences:
Do you allow mixed sex loads?
Is your processing plant location in the "North Central Plains"?
Is your feed yard location in the "North Central Plains"?
Do you pay for shipping?
Do you pay on a shrunk weight?
Do you use a producer agreement?
Do you use a publicly available report for developing your base price?
Do you offer cattle producers a premium for natural cattle?

Note that the questions reported in Table 1 were asked in closed form resulting in a response of either yes or no.

Table 2. Responses to the closed form survey questions for 4 individual categories of information, including general business information, cattle management preferences, cattle quality preferences, and cattle marketing preferences

	Yes	No
General Business Information:	Yes	No
Are you a natural beef marketing company?	72%	28%
Do you purchase feeder cattle from cattle producers?	44%	56%
Do you purchase finished cattle from cattle producers?	72%	28%
Cattle Management:		
Do you have restrictions on the use of antibiotics?	97%	3%
Do you have restrictions on the use of ionophores?	94%	6%
Do you have restrictions on the use of hormones?	94%	6%
Do you have restrictions on the use of animal by products?	94%	6%
Do you have restrictions on the use of mineral supplements?	3%	97%
Do you have requirements for humane treatment?	84%	16%
Do you require verification for source verified cattle?	78%	22%
Do you have restrictions regarding vaccinations?	9%	91%
Do you have restrictions on the use of fly control?	6%	94%
Do you prefer persistently infected (PI) tested cattle?	0%	100%
Cattle Quality:		
Do you require verification for age verified cattle?	75%	25%
Do you have a targeted quality grade?	78%	22%
Do you have requirements on slaughter age?	84%	16%
Do you require angus or black hided cattle?	44%	56%
Do you have restrictions on dairy cattle?	19%	81%
Do you have restrictions on Brahman cattle?	72%	28%
Cattle Marketing:		
Do you allow mixed sex loads?	84%	16%
Is your processing plant location in the "north central plains"?	31%	69%
Is your feed yard location in the "north central plains"?	31%	69%
Do you pay for shipping?	9%	91%
Do you pay on a shrunk weight?	56%	44%
Do you use a producer agreement?	84%	16%
Do you use a publicly available report for developing your base price?	100%	0%
Do you offer cattle producers a premium for natural cattle?	84%	16%

Table 3. Categorical responses to follow up questions in the Type of Business section of the survey

Survey questions	Number of respondents	Responses ≤ 600 pounds	>600 pounds	≤ 1200 pounds	>1200 pounds
What size feeder cattle do you purchase?	14	85%	15%		
What size finished cattle do you purchase?	23			63%	37%

Note, there were 32 companies surveyed.

Table 4. Categorical responses to follow up questions regarding preferences for naturally produced cattle that have restrictions on antibiotics, ionophores, hormones, animal by-products, and mineral supplements

		Follow up Responses						
Survey Questions	Number of Respondents	Some Withdrawl Required	100 Day Withdrawl	120 Day Withdrawl	Prior to Feedlot Entry	300 Day Withdrawl	Never Ever	No Vitamin D2
What restrictions do you have on antibiotics?	31	3%	3%	3%	3%	3%	84%	
What restrictions do you have on ionophores?	30			3%		3%	93%	
What restrictions do you have on hormones?	30		3%	3%		3%	90%	
What restrictions do you have on animal by-products?	30			3%		3%	93%	
What restrictions do you have on mineral supplements?	1							100%

Note there was 32 survey participants in the study.

Table 5. Categorical responses to follow up questions regarding preferences for naturally produced cattle that have restrictions on humane treatment of animals, source verification, vaccinations, and fly control practices

		Categorical Responses to Follow Up Questions					
Survey questions	Number of Respondents	Common Treatment	Third Party Audit	Proof of Training	Affidavit Only	Specific Vaccinations	No Feed Additives
What restrictions do you have on humane treatment?	27	63%	26%	11%			
What verification do you require for source verification?	25		12%		88%		
What restrictions do you have on vaccinations?	3					100%	
What restrictions do you have on fly control?	2						100%

Note there were 32 participants in the phone survey.

Table 6. Categorical responses to follow up questions regarding preferences for naturally produced cattle that have restrictions on quality grade and breed type

Survey Questions	Number of Respondents	No Standard Grade	Mainly Select	Mainly Choice	100% Choice	43% Prime	No Dairy Cattle	No Holstein Cattle	No Brahman Influence	< 1/4 Brahman Influence	< 1/8 Brahman Influence
What is your targeted quality grade?	25	4%	8%	68%	16%	4%					
Do you have restrictions on dairy cattle?	6						83%	17%			
Do you have restrictions on Brahman cattle?	23								70%	17%	13%

Note there were 32 survey participants.

Table 7. Categorical responses to follow up questions regarding preferences for naturally produced cattle that have restrictions on age verification and slaughter age

Survey Questions	Number of Respondents	Affidavit Only	USDA Third Party	< 21 Months	< 24 Months	< 30 Months
What verification do you require for age verified cattle?	24	13%	88%			
What requirements do you have on slaughter age?	27			26%	7%	67%

Table 8. Categorical responses to follow up questions regarding location preferences for feeding, processing and shipping payments associated with naturally produced cattle

Survey Questions	Number of Respondents	North Central Plains	South Central Plains	East Coast	West Coast	North and South Plains	All Four Regions	Pay all Shipping	Pay no Shipping	Negotiable
In which geograhic location is the feed yard for your cattle?	31	32%	16%	6%	19%	23%	3%			
In which geographic location is the processing plant for your cattle?	31	29%	26%	10%	19%	16%				
What do you pay for shipping?	30							10%	37%	53%

Note there were 32 survey participants.

Table 9. Categorical responses to follow up questions regarding preferences for naturally produced cattle assciated with shrinking, purchase agreement verification, information used to form a base price, and price premiums.

Survey Questions	Number of Respondents	Negotiable	Pencil < 3%	Pencil 3% to 4%	Affidavit	Audit	Different for each Deal	Local Market Report	USDA Report	CME Futures	Other	< $5	$5 to $9.99	≥ $10
What shrink do you use?	19	37%	32%	32%										
How is the purchase agreement verified?	28				93%	7%								
Which public report is used to develop a base price?	32						15%	9%	44%	9%	22%			
How much of a premium is paid over the base price?	27											33%	56%	11%

Note there were 32 participant that responded to the survey.