

SELECTED ANGUS BULL BUYERS' PREFERENCES
FOR THE FORMAT AND CONTENT OF ANGUS
BULL SALE CATALOGS

By

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SELECTED ANGUS BULL BUYERS'
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Abstract:

The purpose of this study was to describe selected Angus bull buyers' preferences for the format and content of Angus bull sale catalogs. Additionally, the study sought to determine catalog preferences between commercial cow/calf producers and seedstock producers. The study targeted all cattlemen who purchase or sell Angus bulls and attended four specific events ($N = 2,549$). Descriptive research methodology was used to analyze data collected through a questionnaire to describe the preferences of Angus bull sale catalogs in making bull-buying decisions.

The typical respondent was a 53-year-old male seedstock producer with a bachelor's degree or higher; who markets his calves at the local sale barn; and who produces his own females and retains them as herd replacements. Respondents perceived some level of usefulness for all performance traits when making bull-buying decisions. Calving Ease Direct (CED), Birth Weight EPD (BW), Weaning Weight EPD (WW), Yearling Weight EPD (YW), Scrotal Circumference EPD (SC), Docility (Doc), Marbling EPD (Marb), Maternal Milk EPD (Milk), Ribeye Area EPD (RE), Weaned Calf Value (\$W), Beef Value (\$B), and Actual Birth Weight (Act BW) are traits respondents found the most useful of available performance traits.

Respondents preferred viewing bull sale catalogs with a combination of a printed copy and online version. They preferred a photo of the animal being sold to be included in the catalog when making bull-buying decisions. Scrotal Circumference EPD was the only performance trait seedstock producers found more useful than commercial cow/calf producers. Eleven performance traits were found more useful with commercial cow/calf producers than seedstock producers. Significant differences exist between seedstock producers and commercial cow/calf producers for seven format preferences.

Based on the findings of this study, respondents desire to have a large amount of information in bull sale catalogs when making buying decisions. Additional research should be conducted to further investigate catalog preferences and gain understanding of the opinions of cattle producers.

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CHAPTER I

INTRODUCTION

In the cattle industry, the seedstock segment is the basis and beginning of all beef production (Dhuyvetter, Turner, Marston, & Jones, 2004). Producers keep in-depth records on purebred cattle and register them within a given breed association (Dhuyvetter, Turner, Marston, & Jones, 2004). Seedstock cattlemen commonly use live auctions to market their stock, using sale catalogs distributed prior to the auction to provide information on each animal (Chvosta, Rucker, & Watts, 2001).

The Angus breed is the largest segment of the seedstock industry with more than 315,000 head of cattle registered in 2012 (“FAQs,” 2014). The breed was imported to the United States from Scotland in 1873 (Briggs & Briggs, 1980). Nearly a decade later, in 1883, the American Aberdeen-Angus Breeders’ Association was formed, which is currently referred to the American Angus Association (Evans, 2001).

Beef producers make informed management decisions with tight profit margins in the beef industry, decisions that affect seedstock producers who sell bulls as well as commercial cow/calf producers who purchase them (Dhuyvetter, Turner, Marston, & Jones, 2004). The role of seedstock producers is to satisfy their customers’ needs for purchasing cattle (Parish, Rhinehart, & Anderson, 2009). Cattle buyers are willing to pay more to producers who provide relevant information on seedstock sale cattle (Parish, Rhinehart, & Anderson, 2009). Seedstock customers have a need for detailed information

prior to purchasing prospective herd sires, such as expected progeny differences (EPDs) (Parish, Rhinehart, & Anderson, 2009).

Commercial cattle are normally crossbred, unregistered, and often referred to as grade animals (Parish, Rhinehart, & Anderson, 2009). The majority of bull customers are commercial cow/calf producers, who face interpreting a diverse amount of information when selecting breeding bulls (Dhuyvetter, Turner, Marston, & Jones, 2004). “In past years, buyers assessed livestock largely on the basis of traits observable at the time of sale and the reputation of the breeder” (Chvosta, Rucker, & Watts, 2001, p. 286). A large amount of performance information is available on each animal and makes the producer decisions more difficult as they have trouble understanding their options (Dhuyvetter, Turner, Marston, & Jones, 2004). A behavioral economic study by Dhuyvetter, Turner, Marston, and Jones concluded consumers often get overwhelmed with too much information and have a hard time making buying decisions (Dhuyvetter, Turner, Marston, & Jones, 2004).

Bull selection is the foundation of herd improvement as new genetics are added to herds with the purchase of bulls (Greiner, 2009). Producers should identify herd goals and place emphasis on certain genetic priorities that will increase genetic progress within their herds (Greiner, 2009). Evaluating the sale catalog for performance, pedigree, and data allows buyers to determine which bulls meet EPD and other specifications that have been established with their herd goals (Greiner, 2009). “Investments in the right genetics will pay dividends both short and long-term through the influence the bull has on each calf crop as well as his daughters that are retained in the herd” (Greiner, 2009, para. 10).

“Each breeder has the decision to produce cattle to meet own desires and preferences, to produce cattle to meet the desires of potential buyers, or to produce cattle that satisfy both conditions” (Parish, Rhinehart, & Anderson, 2009, pg. 1). To increase profits and genetic quality of a seedstock herd, a producer wants to provide the most appropriate information that will benefit their customers (Dhuyvetter, Turner, Marston, & Jones, 2004). If a seller is unable to

combine the most helpful information in a sale catalog and the bulls are not represented in the best fashion, the bull's value will not be properly denoted (Dhuyvetter, Turner, Marston, & Jones, 2004).

Statement of Problem and Purpose

An abundant amount of information can be provided in sale catalogs, and each seedstock producer caters his or her catalog to provide helpful information for customers (Chvosta, Rucker, & Watts, 2001). However, no research has been completed to establish what information customers find the most useful or how they use that information to make their buying decisions. Therefore, the purpose of this study was to describe selected Angus bull buyers' preferences for the format and content of Angus bull sale catalogs.

Objectives

The following objectives were used to guide this study:

1. Describe specific characteristics (state of residence, age, sex, education, type of producer, marketing practices and number of cattle owned or managed, Angus bulls sold or bought annually, and Angus-influenced calves sold at weaning) of selected Angus bull buyers.
2. Determine the usefulness of individual bull performance data in a bull sale catalog as perceived by selected Angus bull buyers.
3. Describe selected Angus bull buyers' format preferences for a bull sale catalog.
4. Determine differences in catalog preferences between commercial cow/calf producers and seedstock producers.

Significance

Angus producers work to educate their customers in the best way possible about their bull sale offerings and the information on these animals. The American Angus Association maintains a large database of information to record all submitted performance data on all registered animals (Dhuyvetter, Turner, Marston, & Jones, 2004). To have this information, producers must spend

time and money to gather data for each animal. This information is available to appear in a bull sale catalog, depending on the producer's choice.

Some factors on which customers base their decisions are pedigree, performance data, photos, scan data, age, herd ratios, dam production records, quantity of bulls raised, and environment in which bulls were raised. From raising the animal, keeping records, and hosting a bull sale, producers have significant costs. This study should help determine what information must be gathered on each animal and what information is the most beneficial to include in the sale catalog. Including the most useful information in the sale catalog would help both the seedstock producer selling the product and the customer. For example, seedstock producers may not need to invest the time and money needed to collect DNA samples and provide genomic profiles such as HD50K for their customers if the customers do not use that information in their bull-buying decisions.

If the only information included in the sale catalog aids the customer's buying decisions, catalogs may be easier and less confusing to read as customers study the catalog before the sale. A marketing study by Arunachalam, Henneberry, Lusk, and Norwood (2009) showed more choice does not always benefit consumers. These authors found a "significant portion of individuals will voluntarily reduce their choice-set size in setting where the only obvious reason is to make the choice task easier [sic]" (Arunachalam, Henneberry, Lusk, & Norwood, 2009, p. 15).

The way customers view these catalogs also plays a role in cutting costs. Producers may benefit from knowing whether the customers need to have printed copies to view the offering or if they can make their decisions based on an online version. If a pamphlet or brochure could be sent to replace a full-spread catalog, the printing and mailing costs could be reduced drastically (Cutrer, 2011).

This research is directly tied to Priority 2 of the National Research Agenda: New Technologies, Practices, and Products Adoption Decisions. One of the priority's more specific

focuses is to “determine the types of knowledge, skills, environment, and support systems that facilitate decision-making and adoption processes by individuals and groups” (Doefert, 2011, p. 8). Consumer demands, behaviors, and needs constantly change in the cattle industry based on technologies and available information (Vestal, Lusk, DeVuyst, & Kropp, 2013). This study is relative to this priority as it determines the decisions “to achieve positive outcomes” for bull buying in the cattle industry (Doefert, 2011, p. 8).

Limitations

The following limitations were noted in this study:

1. The study cannot be generalized beyond the respondents.
2. The study cannot be generalized to any specific cattle breed association, including Angus.
3. The study cannot be generalized to other industry organizations.
3. Due to the nature of the methodology, respondents were limited to those attending specific events.

Assumptions

The following assumptions were acknowledged in this study:

1. Respondents were honest regarding their preferences for the format and content of Angus bull sale catalogs.
2. The respondents’ preferences for Angus bull sale catalogs could be measured with a questionnaire.
3. The selected sample was purposeful and representative of all Angus bull sale customers across the United States.
4. No respondents completed the questionnaire more than once.

Definitions

The following definitions were used to guide this study:

\$Value Indexes: “are multi-trait selection indexes expressed in dollars per head, to assist beef producers by adding simplicity to genetic selection decisions. The \$Value is an estimate of

how future progeny of each sire are expected to perform, on average, compared to progeny of other sires in the database if the sires were randomly mated to cows and if calves were exposed to the same environment” (“EPD and \$Value Definitions,” 2014, para. 27).

Accuracy (ACC): “is the reliability that can be placed on the EPD. An accuracy of close to 1.0 indicates higher reliability. Accuracy is impacted by the number of progeny and ancestral records included in the analysis” (“EPD and \$Value Definitions,” 2014, para. 4).

Beef Value (\$B): “an index value expressed in dollars per head, is the expected average difference in future progeny performance for postweaning and carcass value compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 31).

Birth Weight EPD (BW): “expressed in pounds, is a predictor of a sire’s ability to transmit birth weight to his progeny compared to that of other sires” (“EPD and \$Value Definitions,” 2014, para. 7).

Calving Ease Direct (CED): “is expressed as a difference in percentage of unassisted births, with a higher value indicating greater calving ease in first-calf heifers. It predicts the average difference in ease with which a sire’s calves will be born when he is bred to first-calf heifers” (“EPD and \$Value Definitions,” 2014, para. 6).

Calving Ease Maternal (CEM): “is expressed as a difference in percentage of unassisted births with a higher value indicating greater calving ease in first-calf daughters. It predicts the average ease with which a sire’s daughters will calve as first-calf heifers when compared to daughters of other sires” (“EPD and \$Value Definitions,” 2014, para. 15).

Carcass Weight EPD (CWI): “expressed in pounds is a predictor of the difference in hot carcass weight of a sire’s progeny compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 22).

Cow Energy Value (\$EN): “expressed in dollar savings per cow per year, assesses differences in cow energy requirements as an expected dollar savings difference in daughters of sires. A larger value is more favorable when comparing two animals (more dollars saved on feed

energy expenses). Components for computing the cow \$EN savings difference include lactation energy requirements and energy costs associated with differences in mature cow size” (“EPD and \$Value Definitions,” 2014, para. 21).

Daughters (MkD): “reflects the number of daughters that have progeny weaning weight records included in the analysis” (“EPD and \$Value Definitions,” 2014, para. 18).

Docility (Doc): “is expressed as a difference in yearling cattle temperament, with a higher value indicating more favorable docility. It predicts the average difference of progeny from a sire in comparison with another sire’s calves. In herds where temperament problems are not an issue, this expected difference would not be realized” (“EPD and \$Value Definitions,” 2014, para. 13).

Expected Progeny Difference (EPD): “is the prediction of how future progeny of each animal are expected to perform relative to the progeny of other animals listed in the database. EPDs are expressed in units of measure for the trait, plus or minus” (“EPD and \$Value Definitions,” 2014, para. 2).

Fat Thickness EPD (Fat): “expressed in inches, is a predictor of the differences in external fat thickness at the 12th rib (as measured between the 12th and 13th ribs) of a sire’s progeny compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 25).

Feedlot Value (\$F): “an index value expressed in dollars per head, is the expected average difference in future progeny performance for postweaning merit compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 29).

Genomic-Enhanced Expected Progeny Differences (GE-EPDs): “are the best estimate of an animal’s genetic worth as a parent. These values make use of known pedigree, performance and genomic information about an animal, its progeny and other relatives” (“GE-EPDs and Genomic Trait Tests,” 2014, para. 1).

Grid Value (\$G): “an index value expressed in dollars per head, is the expected average difference in future progeny performance for carcass grid merit compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 30).

Heifer Pregnancy (HP): “is a selection tool to increase the probability or chance of a sire’s daughters becoming pregnant as first-calf heifers during a normal breeding season. A higher EPD is the more favorable direction and the EPD is reported in percentage units” (“EPD and \$Value Definitions,” 2014, para. 14).

Herds (MkH): “indicate the number of herds from which daughters are reported” (“EPD and \$Value Definitions,” 2014, para. 17).

Marbling EPD (Marb): “expressed as a fraction of the difference in USDA marbling score of a sire’s progeny compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 23).

Maternal Milk EPD (Milk): “is a predictor of a sire’s genetic merit for milk and mothering ability as expressed in his daughters compared to daughters of other sires. It is that part of a calf’s weaning weight attributed to milk and mothering ability” (“EPD and \$Value Definitions,” 2014, para. 16).

Mature Height EPD (MH): “expressed in inches, is a predictor of the difference in mature height of a sire’s daughters compared to daughters of other sires” (“EPD and \$Value Definitions,” 2014, para. 20).

Mature Weight EPD (MW): “expressed in pounds, is a predictor of the difference in mature weight of daughters of a sire compared to daughters of other sires” (“EPD and \$Value Definitions,” 2014, para. 19).

Quality Grade (\$QG): “\$GQ represents the quality grade segment of the economic advantage found in \$G. \$GQ is intended for the specialized user wanting to place more emphasis on improving quality grade. The carcass marbling (Marb) EPD contributes to \$QG” (“EPD and \$Value Definitions,” 2014, para. 30).

Residual Average Daily Gain (RADG): “expressed in pounds per day, is a predictor of a sire’s genetic ability for postweaning gain in future progeny compared to that of other sires, given a constant amount of feed consumed” (“EPD and \$Value Definitions,” 2014, para. 10).

Ribeye Area EPD (RE): “expressed in square inches, is a predictor of the difference in ribeye area of a sire’s progeny compared to progeny of other sires” (“EPD and \$Value Definitions,” 2014, para. 24).

Sale Catalog: “A book that is put together by the breeder focusing on pedigrees, pictures, performance data of the animals selling, targeting other breeders who would be interested in their cattle/beef program” (S. Mayes, personal communication, April 23, 2015).

Scrotal Circumference EPD (SC): “expressed in centimeters, is a predictor of the difference in transmitting ability for scrotal size compared to that of other sires” (“EPD and \$Value Definitions,” 2014, para. 12).

Weaned Calf Value (\$W): “an index value expressed in dollars per head, is the expected average difference in future progeny performance for preweaning merit. \$W includes both revenue and cost adjustments associated with differences in birth weight, weaning direct growth, maternal milk and mature cow size” (“EPD and \$Value Definitions,” 2014, para. 28).

Weaning Weight EPD (WW): “expressed in pounds, is a predictor of a sire’s ability to transmit weaning growth to his progeny compared to that of other sires” (“EPD and \$Value Definitions,” 2014, para. 8).

Yearling Height EPD (YH): “is a predictor of a sire’s ability to transmit yearling height, expressed in inches, compared to that of other sires” (“EPD and \$Value Definitions,” 2014, para. 11).

Yearling Weight EPD (YW): “expressed in pounds, is a predictor of a sire’s ability to transmit yearling growth to his progeny compared to that of other sires” (“EPD and \$Value Definitions,” 2014, para. 9).

Yield Grade (\$YG): “\$YG represents the yield grade segment of the economic advantage found in \$G. \$YG is intended for the specialized user wanting to place more emphasis on red meat yield. It provides a multi-trait approach to encompass ribeye, fat thickness and weight into an economic value for red meat yield ” (“EPD and \$Value Definitions,” 2014, para. 30).

CHAPTER II

REVIEW OF LITERATURE

This chapter is a review of appropriate literature, which provides a framework to the study. Topics include value of purebred livestock, history of American Angus Association, development of catalogs, economic factors influencing purchases, marketing factors influencing purchases, and an overview of the theoretical framework based on uses and gratifications theory.

Value of Purebred Livestock

“Because the beef industry is not vertically integrated like much of the pork and poultry industries, improving meat quality and cost-competitiveness will ultimately start with the selection of high-quality breeding stock” (Vestal, Lusk, DeVuyst & Kropp, 2013, p. 337). According to a Mississippi State University Extension Service report in 2009 by Parish, Rhinehart, and Anderson, seedstock cattle have documented pedigrees, have estimated genetic merit values, and are normally registered with a breed association as purebred cattle. Seedstock operations focus on genetic improvement and are considered genetic suppliers or breeders (Parish, Rhinehart, & Anderson, 2009). “Genetic progress in the beef industry occurs through seedstock selection” (Vanek, Watts, & Brester, 2008, p. 361).

The three most essential markets for Angus cattle and other purebred breeds are commercial cattle producers, cattle feeders, and landowners who own no cattle and may be interested in establishing a herd of Angus-based cattle (Evans, 2001). The first and most important is the commercial cow/calf producers that can be influenced to use Angus bulls

on their commercial herds (Evans, 2001). They represent the quickest way to increase demand for Angus cattle since they buy bulls almost on an annual basis (Evans, 2001). “No breed can survive without the support of the commercial beef cattle industry” (Evans, 2001, p. 128).

An Overview of the Angus Breed

This section is a review of the origin and history of the Angus breed worldwide and in the United States. There have been many advances in promotional efforts and advertising, which have allowed the Angus breed to expand as the largest beef breed in the world (“FAQs,” 2014).

Origin of Angus Cattle

In northeastern Scotland, the counties of Aberdeen and Angus were noted early for their agricultural successes (Briggs & Briggs, 1980). The county of Aberdeen was known as the most productive agricultural region in Scotland, and the county of Angus excelled in the production of potatoes, grain crops, and feed (Briggs & Briggs, 1980). Both Aberdeen and Angus counties have become famous in the history of the Angus cattle breed (Briggs & Briggs, 1980).

In the United Kingdom, three defined and distinct breeds of polled cattle were raised (Briggs & Briggs, 1980). Polled cattle are hornless, and the three main breeds were Aberdeen-Angus, Galloway, and the red polled Norfolk and Suffolk (Briggs & Briggs, 1980). Early Scottish cattle varied in color patterns and many were polled, but some had horns (Briggs & Briggs, 1980). Polled cattle were often referred to as “doddies,” “humble,” “humlies,” or “homyl” (Briggs & Briggs, 1980).

Cattle from two areas of Scotland were combined in the formation of the Aberdeen-Angus breed (Briggs & Briggs, 1980). It is believed there were polled cattle in Aberdeen in the 16th century (Briggs & Briggs, 1980). The cattle in the county of Angus often were referred to as Angus doddies, and in the area of Aberdeenshire, polled cattle were called Buchan “humlies” (Briggs & Briggs, 1980). In the 18th century, breeders worked to improve their cattle, and as a result, the Angus doddie and Buchan humlie strains were crossed (Briggs & Briggs, 1980).

In the beginning of the 19th century, Buchan polled cattle were favored as market cattle for meat production (Briggs & Briggs, 1980). The early herds of the Aberdeenshire area famous in the 1800s were those of George Williamson and Robert Walker (Briggs & Briggs, 1980). In Angus county, Angus doddies were in the herds of Alexander Bowie, William Fullerton, Lord Panmure, and Lord Southesk (Briggs & Briggs, 1980).

Hugh Watson of Keillor is often referred to as the founder and first real improver of Aberdeen-Angus cattle (Briggs & Briggs, 1980). His family had cattle as early as 1735, and in 1808 he started his own herd (Briggs & Briggs, 1980). Watson decided the color of his cattle would be black, and he began making breeding selections with color as an important factor (Briggs & Briggs, 1980). His favorite bull was Old Jock 126, who was recorded as the first Angus bull in the first Aberdeen-Angus herd book (Briggs & Briggs, 1980). Watson also owned the famous cow, Old Granny 125, who was the first cow listed in the herd book (Briggs & Briggs, 1980). Both Old Jock and Old Granny were foundation animals in the breed, and many Angus cattle would trace back to them (Briggs & Briggs, 1980). An Aberdeen cow, Black Meg 43, is also referred to as the founder of the breed since more cattle trace back to her than any other female in the origin of the breed, including Old Granny 125 (Briggs & Briggs, 1980).

William McCombie of Tillyflour is referred to as the great preserver of the Aberdeen-Angus breed (Briggs & Briggs, 1980). He is known for carefully planned matings, management skills, show ring success, and publicizing his cattle in the 1800s (Briggs & Briggs, 1980). Prior to McCombie's time, people referred to the cattle as Aberdeen and Angus, and his herd justified leaving the "and" out and replacing it with the hyphen that was used in the official breed name (Briggs & Briggs, 1980). The Aberdeen-Angus breed took shape with his herd, and his master breeding combined the two original strains of cattle into one superior breed (Briggs & Briggs, 1980).

First Noted Sale of Angus Cattle

No records are available of many of the early sales of Aberdeen-Angus cattle (Macdonald & Sinclair, 1910). “Much interesting and useful information regarding the history of the breed is derived from a study of the catalogues and price lists of important sales of polled cattle” (Macdonald & Sinclair, 1910, p. 614). Lord Panmure held the first noted sale in October 1841 at Brechin Castle in Scotland (Macdonald & Sinclair, 1910). At this sale, William Fullerton purchased a bull, Panmure 51, for £17 17s (Macdonald & Sinclair, 1910).

Early History of Angus Cattle in the United States

The first Aberdeen-Angus cattle were brought to America from Scotland in 1873 (“Angus History,” 2014). George Grant transported three bulls to the Kansas prairie of the United States of America (Evans, 2001). The bulls most likely were from the herd of George Brown of Westertown, Fochabers, Scotland (“Angus History,” 2014). Grant was a London businessman and Scotland native who was financed with a large land grant from the Kansas Pacific Railroad in the current area of Victoria, Kansas (Evans, 2001).

Progressive cattlemen at the time mainly used Shorthorn and Hereford breeds, both with a red and white color combination and often horned (Evans, 2001). Grant’s purebred bulls were bred strictly to native longhorn cows, and the hornless black offspring were often called “black muleys” (Evans, 2001, p.13). The bulls’ real worth was proven when their black hornless calves thrived in the Midwest climate (“Angus History,” 2014). The Angus-cross calves survived well on the winter range and weighed more the next spring compared to other breeds (“Angus History,” 2014).

The first Angus bulls in America were exhibited at the Kansas City Livestock Exposition and were a new trend to the cattle community with their polled heads and solid black phenotype (“Angus History,” 2014). They were considered “freaks” to some because their physical attributes were not common in the United States (“Angus History,” 2014, para. 1). “The Aberdeen-Angus cattle have overcome obstacles and prejudices such as few breeds have been subjected to; and throughout the length and breadth of the American continent they have alike on the prairie as

range cattle, in the corn belt as feeders, and at the block as beef-producers proclaimed their superiority with a clearness that admits of no question” (Macdonald & Sinclair, 1910, p. 342).

Between 1880 and 1883, it was estimated 2,000 head of Aberdeen-Angus cattle were imported into the United States and Canada (Macdonald & Sinclair, 1910). The first Angus herds in America were formed with stock directly from Scotland, and more than 1,200 cattle were imported between 1878 and 1883 (“Angus History,” 2014). This time of growth was continued through registered herds showing, breeding, and selling their stock across the United States (“Angus History,” 2014).

On November 21, 1883, the American Aberdeen-Angus Breeders’ Association was founded in Chicago, Illinois (“Angus History,” 2014). Charles Gudgell served the group as chairman, and E.M. Whedon was secretary when the association was established (Evans, 2001). Sixty members on a committee led by H.C. Burleigh purchased 62 shares of stock at \$10 each in the association’s beginning (Evans, 2001). The business offices of the association were to be in Kansas City, Missouri, and they were incorporated under the laws of Illinois (Evans, 2001). The first headquarters were established in Independence, Missouri, at the home of Charles Gudgell (Evans, 2001).

More than 10 million head were recorded in the first century of business, and the first herd book in the United States was released in June 1886 (Evans, 2001). The herd book had 5,200 entries and only 2,250 of them belonged to 178 American owners (Evans, 2001). The remaining entries belonged to 362 breeders in Scotland and were only included because they were ancestors of American-owned cattle (Evans, 2001). Ed Ravenscroft released the original national herd book for Aberdeen-Angus cattle breed in 1862 (Macdonald & Sinclair, 1910). “The birth of the American Angus Association was one small but significant part of the exciting revolution in American agriculture during the last quarter of the 19th century” (Evans, 2001, p. 11).

These were good times for the cattle industry after the Civil War, and a buildup in cattle numbers continued until 1890 (Evans, 2001). The demand for beef cattle and beef was due to

population increase in the United States, westward expansion, and Civil War recovery (Evans, 2001). Beef consumers became more discriminating, and, in return, cattlemen worked toward herd improvement, as a result the Angus breed started to impress cattle producers, feeders, and some packers (Evans, 2001). “As store cattle, Aberdeen-Angus are in constant demand. When they are offered at sales, they are snapped up like ‘hot cakes’ ” (Macdonald & Sinclair, 1910, p. 367). Aberdeen-Angus cattle showed steady development as an estimated 50,000 purebred Aberdeen-Angus cattle were in the United States 20 years after the start of the association (Macdonald & Sinclair, 1910).

Angus Cattle Today

Currently, Angus has the largest beef breed registry in the world (“Angus History,” 2014). During the fiscal year of 2012, producers registered 315,007 Angus cattle (“FAQs,” 2014). The American Angus Association headquarters have been located in St. Joseph, Missouri, since 1956 (Evans, 2001). The mission of the American Angus Association is “to provide programs, services, technology and leadership to enhance the genetics of the Angus breed, broaden its influence within the beef industry, and expand the market for superior tasting, high-quality Angus beef worldwide (“Mission Statement,” para. 1).”

Promotion of the Angus Breed

The first organized promotion for the Angus breed in the United States was started by American Aberdeen-Angus Association Secretary Thomas McFarlane in the early 1900s, and pamphlets were published and distributed with recordings of Angus winnings at stock shows (Evans, 2001). To help Angus breeders market their stock, in 1909, Charles Gray published a promotional booklet, *Supremacy of Aberdeen-Angus Cattle* for promotion and advertising (Evans, 2001). During this time period, Gray also placed Angus-related advertisements in several publications, including *The Breeder’s Gazette*, *Progressive Farmer*, *Country Gentleman*, and *La Hacienda* (Evans, 2001). *The Breeder’s Gazette* was founded in 1881 and was dedicated to the purebred livestock industry — horses, cattle, sheep, and hogs (Evans, 2001). This was the main

publication for livestock breeding and marketing at the time, and it reported some Angus show results (Evans, 2001). In 1919, *The Aberdeen-Angus Journal* was established and provided more coverage of Angus events for Midwest cattle producers and Angus breeders (Evans, 2001).

In the 1930s, the association began to focus on marketing and advertising for their breeders (Evans, 2001). Consignment auctions formed through different regions of the United States because breeders were having a difficult time marketing small numbers of cattle to the public (Evans, 2001). Association-sponsored consignment auctions advertised and marketed their sale offerings to a regional and national audience through ads in *The Aberdeen-Angus Journal* (Evans, 2001). Angus advertising and promotions continued to improve, and in the late 1940s, the association launched a national advertising program that proclaimed Angus cattle brought more per pound at market than any other breed of cattle (Evans, 2001). “Over the years this helped Angus win the West, and the rest of the nation as well” (Evans, 2001, p. 94).

In 1946, Lloyd D. Miller was recruited at the association as the “publicity man” (Evans, 2001, p. 128). He led what was later named the public relations department for 22 years and developed programs that remained in use until the end of the 20th century (Evans, 2001). He started with a basic program that distributed news releases of Angus activities, including about commercial cattlemen who used registered Angus bulls on their operations (Evans, 2001). Henry Barger joined Miller to help produce a promotional booklet constructed to sell Angus bulls to commercial cattlemen (Evans, 2001). Released in October 1950, *Blacks Breed Better Beef* was an instrumental promotional piece for the association and Angus breed (Evans, 2001). After Barger’s work with this promotion, he was hired as a marketing and advertising consultant in 1951 and held this position for 31 years (Evans, 2001).

Barger was a convincing advertising executive and marketer (Evans, 2001). He persuaded the association’s board and staff the association needed an advertising program focused on promoting economic benefits of the Angus breed as well as the overcoming prejudices of Angus cattle that were common in the range states of America (Evans, 2001). Barger was also

the one who recommended the association refer to the breed as Angus instead of Aberdeen-Angus (Evans, 2001). He believed the Aberdeen-Angus sounded “highfalutin,” and the name was officially changed in 1956 (Evans, 2001, p. 130). The named of the association was shorted in the 1950s to the American Angus Association (“Angus History,” 2014).

Miller remained director of public relations for 22 years and became the seventh secretary of the American Angus Association in 1968 (Evans, 2001). Evans said, “He had built the best information and advertising program in the beef cattle industry” (Evans, 2001, p. 199). Miller appointed Robert C. Snyder in 1968 as the new director of public relations, and Keith E. Evans was named associate manager and director of the association’s national advertising program (Evans, 2001). In 1969, Miller hired Richard L. Spader in the public relations department, who would become the ninth chief executive officer 12 years later (Evans, 2001). In 1971, the primary function of the national Angus advertising was changed to promote the Angus breed advantages to the commercial cattle industry, particularly potential bull buyers (Evans, 2001).

In November 1978, the board approved the purchase of the *Aberdeen-Angus Journal* from Murray Frentz and the Hahne family from Iowa (Evans, 2001). Fred Hahne had published the first Aberdeen-Angus Journal in 1919, and the first issue published by the association was released in 1979 (Evans, 2001). After purchase of the magazine, the association also shortened the name to *Angus Journal* (Evans, 2001).

From the mid-1980s on, a high priority of the association was measuring the impact of advertising and promotions (Evans, 2001). They had an on-going research project from 1985 to 2000 involving the use of commercial cattle producers’ bull-buying decisions (Evans, 2001). When the first survey was conducted in 1985, only 26% commercial producers had purchased an Angus bull. However, surveys found in 2000 nearly 60 percent of commercial producers had bought at least one Angus bull in 1999 (Evans, 2001). These results did not affect association

promotional efforts and only gave them buying trends of commercial cattlemen over this time span (Evans, 2001).

Foundation of API and API Special Services Department

Angus Productions, Inc. (API) was formed in 1979 as a for-profit corporation owned entirely by the association to publish the *Angus Journal* and other for-profit business (Evans, 2001). The API Special Services Department was founded in 1985 to produce sale catalogs (sale books), herd brochures, and other promotional material (Evans, 2001). Terry Cotton was named head of this department, and they returned a profit in the first year of business (Evans, 2001).

Promotion is using publicity and advertising to further the acceptance and sale of merchandise (Parish, Rhinehart, & Anderson, 2009). Focusing on sale books, Angus catalogs tell as much about a producer as the animals they promote (“API Special Services,” 2014). A catalog’s image is created based on individual tastes to create a successful marketing strategy that suits an operation (“API Special Services,” 2014). “Seedstock producers use unique promotion formats to market bulls, the informational content provided by sale advertisements is similar across producers” (Vanek, Watts, & Brester, 2008, p. 352). The investment of promotional efforts is an important portion of the marketing process (Parish, Rhinehart, & Anderson, 2009). To be competitive in the communication and promotion side of agriculture, API works to be cost efficient and to provide the services the members need (“API Special Services,” 2014).

The API Special Services Department has access to the American Angus Association records, which is an advantage, in terms of simplicity and communication (S. Mayes, personal communication, April 23, 2015). The American Angus Association registration database has the ability to insert the most updated pedigree and performance data for each animal in the catalogs they create, and graphic designers work to create art designs desired by producers (“API Special Services,” 2014). Using the official membership list from the American Angus Association, a mailing service is available, a service which can be customized to target breeders who are local to

sellers' operations and would be the most interested in purchasing animals ("API Special Services," 2014). Several other businesses and individuals create bull sale catalogs other than API; however, API is one of the most commonly used in the Angus industry ("API Special Services," 2014).

Catalogs

Prior to a cattle auction, buyers receive a sale catalog containing information on various characteristics of the sale animals (Chvosta, Rucker, & Watts, 2001). "A catalog is considered to be any printed material that is greater than four pages and is generally bound by saddle stitching, staples or perfect binding (Cutrer, 2011, p. 42). This type of print advertising is one of the most time consuming and largest advertising efforts livestock marketers will prepare (Cutrer, 2011). Catalogs require advance planning to allow time for writing content, obtaining photographs, printing, and mailing (Cutrer, 2011).

Pricing for sale books depends on several factors, including number of page and photos, color usage on cover/text pages, and the number of books needed. A more economical method to reach the buyer audience could be through a brochure or pamphlet (Cutrer, 2011). They can be used to promote a sale or operation and are a method for interested breeders to contact a producer and request to be added to their mailing lists ("API Special Services," 2014).

History of Angus Performance Information

Show results based on phenotype meant almost everything to Angus producers in the 1940s, '50s, and '60s (Evans, 2001). "A bull's show record literally established the value of his progeny" (Evans, 2001, p. 145). In the fall of 1962, it was obvious performance records would change the role of Angus cattle breeding (Evans, 2001). In the 1980s, shows were becoming less important in herd sire selection and in determining monetary value of animals (Evans, 2001).

Frank Richards had led the association as secretary for more than 17 years (1946-1963) and into one of the most exciting eras for Angus cattle (Evans, 2001). In the early stages of development, he did not fully understand performance records and the Angus Herd Improvement

Records (AHIR) program (Evans, 2001). “Frank Richards believed in the ultimate judgment of shows and in the art rather than the science of breeding cattle” (Evans, 2001, p. 168). However, Richards fully supported the AHIR program when it was introduced in 1957 at the third National Angus Conference, which was held at Michigan State University (Evans, 2001).

The AHIR program was discussed and promoted for many years before it was initiated with the association (Evans, 2001). At the first National Angus Conference in 1955, A.D. Webber told breeders it was time to start performance testing their cattle (Evans, 2001). Doyle Chambers also explained to the conference attendees that visual selection was not enough (Evans, 2001).

“... Chambers said ‘It has shown that, even among beef bulls which were considered to be of equal merit so far as one is able to ascertain by visual means, there may be rather large differences in their ability to sire calves from comparable cows. [Their progeny] may differ markedly in weights, grades, feedlot performance, carcass grades, and, of course, in their returns to the cattle producer and feeder.’” (Evans, 2001, p. 180)

The 1970s were tough but progressive times for the Angus breed (Evans, 2001). There were new ways to market and advertise Angus bulls as breeders relied more on science to improve their herds (Evans, 2001). Richard Willham was an innovator and huge contributor to the 1970s Angus Enlightenment (Evans, 2001). Willham computed estimated breeding values (EBV) to predict genetic worth using ratios for Angus cattle enrolled in the AHIR program (Evans, 2001). In March 1972, the national Angus sire evaluation was presented and approved at the association’s board meeting (Evans, 2001). This tool was designed to compare cattle from all areas of the country under different management systems using pounds as expected progeny differences (EPDs) (Evans, 2001). “Commercial beef cattle producers, discovered EPDs, the product of national cattle evaluation, and used them to take much of the guesswork out of bull selection and buying [sic] ” (Evans, 2001, p. 204).

In November 1974, the first Angus *Sire Evaluation Report* was issued and listed 25 bulls performance information (Evans, 2001). The first report listed traits measured for weaning

weight, yearling weight, carcass grade, and carcass cutability (Evans, 2001). Field-data evaluation was proposed to include many bulls instead of only those that had completed a structured sire evaluation program (Evans, 2001). The field-data report was revolutionary for the Angus breed and changed the way commercial cattle producers selected bulls for their herds (Evans, 2001). In the late 1990s, the need for structured programs to determine animal body composition was eliminated due to the introduction of ultrasound, which was able to measure carcass differences in live animals (Evans, 2001).

“Performance records, more and more Angus breeder and commercial bull buyers had discovered, were the key to herd improvement. The performance registration certificate had been introduced in 1981, National Cattle Evaluation was adopted in 1985, the carcass evaluation procedure was revised in 1986, and expected progeny differences (EPDs) replaced estimated breeding values (EBVs) in 1987. Performance records were not only making it easier for registered breeders to develop sound breeding programs, but were taking much of the guesswork out of bull buying and selection for commercial cattle producers. The Angus performance database and EPDs that were generated were regarded by many as the most accurate and dependable in the industry. Angus breeders using this latest technology, were breeding better cattle. Angus bulls provided commercial producers with more options and more benefits than any other single breed” (Evans, 2001, p. 284).

Economic and Marketing Factors Influencing Purchases

Related to economic factors influencing purchases, the primary research is based upon economic analysis of factors that affect a bull’s value. Studies have created hedonic models based upon characteristics of cattle and marketing practices that affect price (Chvosta, Rucker, & Watts, 2001; Dhuyvetter, Schroeder, Simms, Bolze, & Geske, 1996; Dhuyvetter, Turner, Marston, & Jones, 2004; Vanek, Watts, & Brester, 2008; Vestal, Lusk, DeVuyst, & Kropp, 2013). “A hedonic model is an ‘indirect’ valuation method in which the value of bull characteristics is indirectly

valued from the observed market transactions” (Vestal, Lusk, DeVuyst, & Kropp, 2013, p. 339). These models have been indicators of predicted prices based upon several prominent factors that vary based on physical, genetic, and expected performance characteristics of the bulls (Dhuyvetter, Schroeder, Simms, Bolze, & Geske, 1996).

Two important sources of uncertainty when purchasing bulls are the actual performance-related attributes and the future genetic performance of an animal (Chvosta, Rucker, & Watts, 2001). Actual performance-related attributes of the sale animal often are not observable at the sale (Chvosta, Rucker, & Watts, 2001). Presale measurements such as birth weights and weaning weights are recorded to reduce uncertainty of sale bull’s future genetic performance (Chvosta, Rucker, & Watts, 2001). “Because sellers bear some portion of the costs of buyer presale measurement, the development of such performance measures is in their interest [sic] ” (Chvosta, Rucker, & Watts, 2001, p. 287).

Chvosta, Rucker, and Watts’ research focused on comparing simple performance measures (SPMs) and expected progeny differences (EPDs). A hedonic model was used to determine the estimated price paid for bulls based on a bull’s attributes, sale terms, and future market conditions. The results showed SPMs provided more substantial information than EPDs from a buyer’s perspective. These researchers also noted buyers pay attention to herd-average EPDs to compare animals within the same breed at different operations (Chvosta, Rucker, & Watts, 2001).

A bull’s value is determined by the demand for the traits he possesses (Dhuyvetter, Schroeder, Simms, Bolze, & Geske, 1996). Dhuyvetter, Schroeder, Simms, Bolze, and Geske created a pricing model in 1996 based on two categories: (1) expected performance characteristics and (2) physical and genetic characteristics. This study compared several breeds, but the value of traits was consistent among the breeds. Bulls that were black and polled received premiums. A nonlinear relationship existed with age, which proved producers paid more for 2-year-old bulls over yearlings. Price variability was explained between breeds using the expected

performance variables. A positive correlation existed with bulls that had lower birth weights, higher weaning weights, lower birth weight EPDs, and higher milk EPDs (Dhuyvetter, Schroeder, Simms, Bolze, & Geske, 1996).

Dhuyvetter, Turner, Marston, and Jones (1994) completed a correlated study of the Angus industry to determine the factors influencing the prices of Angus bulls. They used a hedonic model to quantify carcass characteristics, actual weights, and EPDs with their relationship to prices of Angus bulls. Bulls with higher adjusted weaning and yearling weights sold at higher prices, while bulls with high birth weights caused a decrease in price. The production EPDs with significant influence were birth weight, weaning weight, yearling weight, and milk. More emphasis was placed on birth weight EPD than the actual birth weight, but actual weaning and yearling weights were held higher than the respective EPDs. Carcass characteristics buyers used in bidding were ribeye area and intramuscular fat, with more preference on ribeye area. Bulls with a Pathfinder dam also received a premium (Dhuyvetter, Turner, Marston, & Jones, 2004). The Pathfinder Angus program began in 1978 to identify high-quality cattle based on Angus Herd Improvement Records (“Pathfinder Info,” 2015). “In identifying these superior cows, emphasis was placed on early puberty, breeding and early calving, followed by regularity of calving and above-average performance of the offspring” (“Pathfinder Info,” 2015, para. 1).

A value-based beef marketing system pays bull customers based on individual animals’ carcass performance at slaughter (Vanek, Watts, & Brester, 2008). Producers receive premiums for higher quality beef, therefore they place an emphasis on purchasing bulls that will produce progeny with improved high-quality carcass traits (Vanek, Watts, & Brester, 2008). Vanek, Watts, and Brester used a hedonic analysis on four major seedstock producers in the United States to collect their data. Their hedonic model measured the value of heritable traits (EPDs) on bull sale prices. Based on results, the most important trait sought by bull buyers was ribeye area. In their study, cow-calf producers’ placed a higher value on higher quality beef in a value-based

marketing system. By using technological advancements, the seedstock and cow-calf sectors are working to improve carcass quality of the end product (Vanek, Watts, & Brester, 2008).

Genetic information from DNA testing provides value of a bull's genetic make-up, which could determine the tendency for his progeny to have particular quality and growth characteristics (Vestal, Lusk, DeVuyst, & Kropp, 2013). DNA-marker testing is a new technology cow-calf producers can use when making bull-buying decisions (Vestal, Lusk, DeVuyst, & Kropp, 2013). Vestal, Lusk, DeVuyst, and Kropp conducted a study using Identity scores in reference to the Oklahoma Beef Inc. (OBI) Bull Test Station sale. Results showed genetic information was not influential of bull sale prices. Performance and EPD information showed to have significant impact and relevance to price of bulls. The more information provided the better, and a discount was taken if information was not included on an animal (Vestal, Lusk, DeVuyst, & Kropp, 2013). The value of Identity scores will increase with time once producers are familiar, confident, and educated with the information gathered through a DNA test (Vestal, Lusk, DeVuyst, & Kropp, 2013).

Seedstock producers market their cattle differently than producers in any other segment of the beef industry (Parish, Rhinehart, & Anderson, 2009). Compared to commercial cattlemen, differences exist in products, customers, product values, price variations, marketing flexibility, and seller's influence when marketing purebred cattle. Value-added beef cattle genetics are the products for seedstock producers, and if their cattle are a high-quality product, those genetics are worth marketing. If a low-quality product is sold from a seedstock producer, his or her reputation will suffer. Profitability and customer satisfaction are the key focus of marketing effectiveness (Parish, Rhinehart, & Anderson, 2009).

According to Dhuyvetter, Schroeder, Simms, Bolze, and Geske's research, numerous binary variables relate to sale price. This study concluded sale order significantly affected price and the price declined the later the bull was sold in the sale. Bulls sold with pictures included in the sale catalog received 27 to 28 percent higher premiums than those without. These higher

premiums may have been correlated with the fact bulls with photos were of superior quality because the premium decreased if the pictured bull was sold later in the sale. Sellers received a premium if semen rights were retained on a bull, but this premium decreased if a large number of bulls were sold with retained semen rights (Dhuyvetter, Schroeder, Simms, Bolze, & Geske, 1996).

Theoretical Framework

The uses and gratification theory (UGT) is a broad communication-based theory that has been used on several mass media outlets since the 1940s (Ruggiero, 2000). It focuses on understanding why and how people seek specific media to satisfy certain needs they have (Eighmey & McCord, 1998). The burning question of UGT is: “What do people do with media and why do they use media?” (Tsao & Sibley, 2004, p. 766) UGT is applicable to basic communication means and continues to be timeless with evolving mass communication channels (Ruggerio, 2000). The Dictionary of Media and Communications defines uses and gratification theory: “Audiences use the mass media for their own purposes, especially to fulfill needs such as gaining information or being entertained. Thus, certain items in a representation are selected either because they provide entertainment or because they satisfy some need” (Danesi, 2008, p. 296).

Early UGT research was mainly descriptive and interested in classifying the responses of audience members to specific categories (Ruggerio, 2000). At the time, no concept of UGT existed in a theoretical coherence, and the studies were primarily behaviorist and individualist in their manners (Ruggerio, 2000). These early researchers also did not attempt to understand the connection between the psychological or sociological needs and gratifications detected (Ruggerio, 2000).

Some criticisms of early gratifications studies focus on the research that

“leaned too heavily on self-reports, was unsophisticated about the social origin of the needs that audiences bring to the media, was too uncritical of the possible dysfunction

both for self and society of certain kinds of audience satisfaction, and was too captivated by the inventive diversity of audience uses to pay attention to the constraints of text.” (Katz, 1987, p. S37-S38)

The history of UGT dates back to the 1940s when psychologist Herta Herzog conducted a similar approach of research (Ruggerio, 2000). This functionalist perspective of mass media focused on the effects of radio programs on the audience. The main focus point was based on the satisfaction people derive from using a certain media source and the gratification described dimensions of satisfaction of the audience for daytime radio programs (Eighmey & McCord, 1998).

Research conducted in the 1950s and 1960s was a phase where “researchers identified and operationalized many social and psychological variables that were presumed to be the precursors of different patterns of consumption gratifications” (Ruggiero, 2000, p. 5). A functional analysis approach was used to include audience members more heavily and focus on the way humans act with media (Ruggerio, 2000).

During the 1970s, research was based on audience motivations and allowed typologies to be developed based on media gratifying psychological and social needs (Ruggerio, 2000). In 1974, Karl E. Rosengren outlined the paradigm of uses and gratifications research and revived this topic for future studies. He theoretically refined UGT and recommended basic needs of the social environment and personal characteristics of the individual that allows perceived problems and solutions to be concluded (Ruggerio, 2000). This is not the original study for this theory, but it did revamp the issue and has been used in numerous studies since its publication (Ruggerio, 2000). Eleven different items of this paradigm are discussed, and all have examples of research that has and can be done with each. It is important to lay the foundation of this paradigm to better understand studies that have been done and the background they used to set up their methodology (Rosengren, 1974).

The first item states a “certain basic human needs of lower and higher order” and

“epitomizes the behavioral and psychological infrastructure that forms the basis of all human social behavior” (Rosengren, 1974, p. 270). In simple terms, this is the need that makes individuals act and react to certain situations. Rosengren stated, “needs are regarded as the sole and only determinants of behavior” (Rosengren, 1974, p. 272). Individuals act, behave, interact, and react based on social, biological, and social variables (Rosengren, 1974).

The second and third areas of the paradigm are the “differential combinations of intra- and extra-individual characteristics” and “the structure of the surrounding society, including media structure” (Rosengren, 1974, p. 270). Extra-individual characteristics involve an index of interaction potential through variables of status, partner availability, and leisure time; intra-individuals are referred to as moderator variables. To study societal variables, it would be appropriate to compare in different societies. A need exists to combine these two paradigms to determine the influence of intra-individual process and society to the UGT (Ruggerio, 2000).

Items four and five are often grouped together to explain “differential combinations of individual problems, being more or less strongly felt” as well as “perceived solutions to these problems” (Rosengren, 1974, p. 270). These perceived problems may be referred to as individual characteristics, interaction of needs, and surrounding social conditions. The solutions look at the rate of importance of goals and how those goals are achieved (Rosengren, 1974).

One of the most popular areas of this theory is the sixth item: “differential motives for attempts at gratification-seeking or problem-solving behavior” (Rosengren, 1974, p. 270) are used. Motives may be confused with needs or problems, but they often are labeled as motivation. An independent typology of motives should be established to look at the relationship between distributions over the type of motives, problems, and solutions as well the actual patterns of media consumption.

“Differential patterns of actual media consumption,” item seven, looks at the content type and the uses made after its consumed. The variables of measurement may be found by the relationship between consumer and content consumed. The two types of relations are

“consumption relations” and “outside relations.” The association of these relationships can be based upon the type of media consumed, motives for consumption, and individual opinions of problems and solutions.

Item eight refers to the “differential patterns of behavior other than mass media consumption” (Rosengren, 1974, p. 279). To fully understand this method of UGT, the context of other activities and gratifications must be assessed (Rosengren, 1974). The importance of mass media consumption may be compared to the time and utility of other activities that are non-related to mass media, such as time with friends and family. Both these behavior factors lead to item nine, the “differential patterns of gratifications or non-gratifications” (Rosengren, 1974, p. 280), which compares two different studies of gratifications.

The final items of the paradigm, ten and eleven, are “the individual’s combinations of intra- and extra-individual characteristics” as well as “the media structure and other social, political, cultural and economic structures in society” (Rosengren, 1974, p. 270). They represent UGT in media’s ability to affect the audience member and his or her society. These cases look at the interplay and correlation of society and media as well as class structures and how that affects media.

With the paradigm presented by Rosengren, it is pertinent to outline these eleven items and compare the differences and similarities of how they can be used in UGT research (Ruggerio, 2000). The methodology may vary from quantitative or qualitative and this theory can pertain to several areas of mass media. These items build the foundation for research studies and give every aspect of uses and gratification that may be applicable to communications (Rosengren, 1974).

During the 1980s and 1990s, some research looked at the similarities and differences of the perspective from the communicator as well as the audience. In 1983, researchers studied correlations between content preferences, programming structures, and viewing conditions on program choice selection (Webster & Waskshlag, 1983). Media satisfaction also was reevaluated at this time based on the notion of having an active audience (Ruggerio, 2000).

Until the 21st century, most of this research (Eighmey & McCord, 1998; Rosengren, 1974). had been done with mass media channels such as television, radio, and newspapers, but now there is a real interest and need to study uses and gratification with Internet use. UGT and the Internet use can be used to determine the guides for media usage and access for consumer use on the web. The main focus is consumer motivations to use the Internet and understand why they spend time using online resources (Stafford, Stafford, & Schkade, 2004). This type of media is interactive and places a larger emphasis on informal, interpersonal communication. Information travels at unparalleled velocity with the Internet, and content is easily observed, recorded, and copied (Ruggerio, 2000).

A combination of Internet and advertising was applied to the interactivity approach of UGT in a study comparing the United States and Korea in 2005 (Ko, Cho, & Roberts, 2005). Findings suggested users had motives of high information and were more likely to interact with human-message interaction online. There were positive effects of attitudes of interactions on the website, which led to positive attitude of brand and intentions to purchase (Ko, Cho, & Roberts, 2005).

The main question of UGT is, “Why do people become involved in one particular type of mediated communication or another, and what gratifications do they receive from it?” (Ruggerio, 2000, p. 29). Understanding insights to the meaning of attitudes and behaviors by individuals toward the use of certain methods of communication is the basis of UGT (Luo, 2002). “Uses and gratifications are probably functionally related in the sense that uses can lead to gratifications, and gratifications may derive from uses. Use is measured, gratifications assumed” (Rosengren, 1974, p. 281).

Criticisms of UGT deficiencies have been stated for many years, and the theory has continued to refine theoretical perspective (Ruggerio, 2000). Some deficiencies have been stated to be confusion between analytical model and operational definitions and the lack of theoretical justification and internal consistency (Ruggerio, 2000). Other flaws have been stated that the

studies are too individualistic as they focus on audience consumption, too compartmentalized, too simple, and lack certainty (Ruggerio, 2000).

CHAPTER III

METHODOLOGY

In this chapter, the researcher has explained the methods used to conduct this study, including research design, instrumentation, reliability, validity, population, sampling, data collection, and data analysis as well as the approval by the Oklahoma State University Institutional Review Board.

Institutional Review Board

The Oklahoma State University Office of University Research Services and the Institutional Review Board (IRB) must approve research methods to protect the use of human subjects involved in behavioral research before researchers can begin investigation. This study's IRB application number is AG-14-42 and received approval September 25, 2014 (see Appendix A). The modification application received approval October 29, 2014 (see Appendix B).

Research Design

This descriptive study employed quantitative research through a questionnaire (Creswell, 2008). A nonexperimental survey design was used to gather data to describe the preferred bull sale catalog format and content of Angus bull buyers.

Instrumentation

This study used a researcher-designed printed questionnaire (see Appendix C). The items in the questionnaire were not based upon a prior study and were created for the sole purpose of

gathering information for this study. Questions were developed based on the researcher's prior experience in the cattle industry and were reviewed and modified by cattle industry professionals and agricultural faculty at Oklahoma State University. There were not many changes from the panel of experts, but some included rewording the educational level question and using a larger 6-point scale instead of the original 5-point scale.

The items addressed the opinions and characteristics of the respondents. Individual Likert-type items (Clason & Dormody, 1994) were used to gain perceptions about performance information traits and sale catalog format. A 6-point Likert scale was used "to eliminate the 'neutral' in a 'forced choice' survey scale (Allen & Seaman, 2014)." A scale without a mid-point was preferable as respondents make a definite choice rather than choose neutral positions (Garland, 1991). Reliability is increased and deviation is decreased when using a 6-point scale rather than a 5-point scale (Chomeya, 2010). Demographics and involvement in the cattle industry questions were measured with multiple-choice, multiple-answer, and open-ended items.

Items in the instrument were grouped into three sections, including preferred performance information, preferred sale catalog format, and demographics. The first section of items consisted of 34 traits of performance information based on the available information in the Angus breed. Respondents were asked to rate each trait on a six-point Likert scale that was defined as (1) *very useless*, (2) *useless*, (3) *somewhat useless*, (4) *somewhat useful*, (5) *useful*, and (6) *very useful*.

The second section consisted of 15 items investigating preferred sale catalog format. The first two questions were multiple choice, and one had a multiple-answer option if needed. The remaining 13 items were phrases respondents rated based on their agreement levels. The phrases were rated on a six-point Likert scale that was defined as (1) *strongly disagree*, (2) *disagree*, (3) *somewhat disagree*, (4) *somewhat agree*, (5) *agree*, and (6) *strongly agree*.

The third section was 12 demographic questions that included both personal and professional characteristics. Personal items included (a) state of residence, (b) age, (c) sex, and (d) level of education completed. Professional items asked about (a) the sector of cattle industry

that best described the respondent's operation, (b) how the respondent markets calves, and (c) how he or she generates replacement females. The final five questions were open ended and asked for quantities of cattle owned or managed, bulls bought and sold annually, and Angus-influenced calves sold at weaning.

Validity and Reliability

A panel of experts assessed the content and face validity of the instrument and offered suggestions before it was used. The panel consisted of seven Oklahoma State University College of Agricultural Sciences and Natural Resources (CASNR) professors and five industry professionals who raise Angus bulls.

Validity can be thought of as the larger, more encompassing term when you assess the choice of an instrument. Validity requires reliability and describes measurements that accurately answer researchers' questions (Vogt, 2005). Creswell explained the difference in reliability and validity in sharing, "these two terms sometimes overlap and at other times are mutually exclusive. Reliability is generally easier to understand as it is a measure of consistence" (Creswell, 2008, p. 169). Reliability is the "freedom from measurement error" (Vogt, 2005, p. 274). It is the consistency and stability of a measure from repeated uses (Vogt, 2005).

Due to time restrictions in data collection, there was no planned pilot study. In lieu of a pilot study, reliability was measured of the first 28 respondents who completed questionnaire while attending the Gardiner Angus Ranch Bull Sale in Ashland, Kansas, on September 26, 2014. Reliability was calculated on the scaled items using Cronbach's alpha, as this statistic is used to test for internal consistency (Cronbach, 1984). The alpha determines a coefficient to estimate consistency of continuous variable items' scores on an instrument (Creswell, 2008). Instruments used in basic research should have a Cronbach's alpha coefficient of .70 or higher (Nunnally, 1978). Thirty-eight items regarding performance information preferences of bull sale catalogs yielded a Cronbach's alpha coefficient of .959 from the first 28 respondents. Thirteen items regarding the format preferences of bull sale catalogs yielded a Cronbach's alpha coefficient of

.762. With high reliability from the first set, the same instrument was used at the remaining three events and data from the four locations was combined into the final data set. The final data set returned a Cronbach's alpha coefficient of .949 for preferred performance information and alpha of .776 for format preferences.

Population

The study was created and used to target all cattlemen who purchase or sell Angus bulls and attended four specific events ($N = 2,549$). The population for this study consisted of cattlemen who were registered buyers or attendees of bull sales at Gardiner Angus Ranch on September 26-27, 2014; Express Ranches on October 5-6, 2014; and Yon Family Farms on October 31- November 1, 2014; as well as the American Angus Association National Convention and Trade Show on November 4-6, 2014. Two hundred ninety-seven participants completed surveys ($n = 297$). The response rate for this study was 11.65% of the registered participants at the selected events.

A convenience sample was used for this study. "In convenience sampling the researcher selects participants because they are willing and available to be studied" (Creswell, 2008, p. 145). Express Ranches and Gardiner Angus Ranch are the top two herds in the United States for numbers of registered Angus cattle. Yon Family Farms was selected because they are one of the largest operations in the Southeast and had a similar size sale. All sales had more than 300 lots listed in their sale catalogs. Numbers of registered buyers were Gardiner Angus Ranch, 226; Express Ranches, 332; and Yon Family Farms, 241. The American Angus Association National Convention and Trade Show was selected because the event was the largest gathering of Angus producers at one location in 2014. There were 1,750 registered attendees at the 2014 American Angus Association National Convention and Trade Show. The number of registered buyers and attendees total 2,549 people, giving the best number available for the selected population. Although, respondents who completed the questionnaire may have not been registered buyers at the sales, rather cattlemen just attending the sale for other reasons, all respondents from the

American Angus Association National Convention and Trade Show were registered attendees at the event.

The four sites were selected for specific reasons. The three bull sales were targeted to return responses from commercial cow/calf producers. They were all convenient locations for the researcher to travel to and administer the questionnaire in person. There were other options to attend other sales, but these three were similar in size and were used based on consistency among sale sizes. The American Angus Association National Convention and Trade Show was selected to gather opinions of seedstock producers, as they were the most common type of breeder at this purebred cattle event. The purpose behind attending these events was to gather enough information between the two main cattle producer sectors: seedstock and commercial cow/calf producers.

Background of the Researcher

Sally Yon is from Ridge Spring, South Carolina, and is the daughter of Kevin and Lydia Yon. She was raised on her family's Angus cattle operation, Yon Family Farms. Yon has been involved in the Angus cattle industry her entire life. Her background and experiences have allowed her to understand and become familiar with all aspects of bull sale catalogs. Yon created the questionnaire with her previous knowledge of the subject with guidance from fellow cattle producers. Her family has two annual bull sales, and one of those sales was used for this study. As such, some respondents may have been more inclined to complete the questionnaire because of their knowledge of the researcher.

Data Collection

The data was collected through self-administered questionnaires (Warde, 1990) at each event without follow-up. A self-administered questionnaire collects data through the respondent's completion of a document (Warde, 1990). The questionnaires may be distributed through hand delivery to the respondents and collected in person by the researcher (Warde, 1990).

The first collection was at Gardiner Angus Ranch in Ashland, Kansas, on September 26, 2014. The questionnaires were distributed at an educational event prior to the sale. Mark Gardiner introduced the researcher to the group, explained the study, and encouraged guests to complete the questionnaire. The questionnaires were placed on the tables, and those who wished to complete them during the program were able to turn them in at the completion of the event. Questionnaires also were available to all attendees at the sale on September 27, 2014.

The second collection was at Express Ranches in Yukon, Oklahoma, on October 5, 2014. The questionnaires were distributed at an event prior to the sale. They were placed on the tables, and those who wished to complete them during the program could turn them in at the completion of the event. Jarold Callahan introduced the researcher and allowed the researcher to share about her study with attendees. He also spoke to the group and encouraged them several times throughout the program to complete the questionnaire. Questionnaires also were available to all attendees at the sale on October 6, 2014.

The third collection was at Yon Family Farms in Ridge Spring, South Carolina. The questionnaires were distributed on October 31, 2014, at an event prior to the sale. They were placed on the chairs, and those who wished to complete them during the program could turn them in at the completion of the event. Kevin Yon introduced the researcher and allowed the researcher to share about the study. Questionnaires also were available to all attendees at the sale on November 1, 2014.

The fourth collection was at the American Angus Association National Convention and Trade Show in Kansas City, Missouri, on November 4-6, 2014. Questionnaires were distributed during the Angus University program on November 5, 2014. The questionnaires were placed on the tables of the meeting room, and participants were instructed by Dr. Larry Corah who served as emcee for the program, to leave the completed questionnaires at their tables when completed.

Responses from these four specific events totaled 297 respondents. The responses for each event were Gardiner Angus Ranch, 28 (12.39% of registered buyers); Express Ranches, 43

(12.95% of registered buyers); Yon Family Farms, 56 (23.24% of registered buyers); and American Angus Association National Convention and Trade Show, 170 (9.71% of registered attendees).

Data Analysis

Data were analyzed using IBM SPSS Statistics Version 21. Scaled ordinal data from items addressing preferred performance information and sale catalog format statements were analyzed using descriptives (means, modes, standard deviations) and frequencies (percentages). Questions regarding state of residence, sex, education, type of producer, marketing practices, format of catalog, and sale catalog photo preferences were analyzed using frequencies and percentages. Open-ended questions regarding the respondents' ages and number of cattle owned or managed, Angus bulls sold or bought annually, and Angus-influenced calves sold at weaning were analyzed using means and standard deviations. A t-test was used to determine differences between the two largest producer sectors: seedstock producer and commercial cow/calf producer. All scaled ordinal data was analyzed for both groups with means, t scores and p-values. Questions regarding state of residence, sex, education, type of producer, marketing practices, format of catalog, and sale catalog photo preferences were analyzed using frequencies and percentages for both groups.

The scaled ordinal data was treated as individual Likert-type items and reported only descriptive statistics. A study by Clason and Dormody in 1994 reviewed 188 research articles published in the Journal of Agricultural Education; 51 articles (54%) reported only descriptive statistics of Likert-type items compared using parametric statistics such as t-tests in 32 (34%) of the articles (Clason & Dormody, 1994). "It is not a question of right and wrong ways to analyze data from Likert-type items. The question is more directed to answering the research questions meaningfully. Statistical procedures that meaningfully answer the research questions, maintain the richness of the data, and are not subject to scaling debates should be the methods of choice in analyzing Likert-type items" (Clason & Dormody, 1994, p. 34).

The researcher analyzed responses to open-ended questions that were not a number response. The responses were compared for similar content and then organized into added responses based on common themes. The two items that pertained to this included (a) reason participant does not use photos in bull-purchasing decisions and (b) other ways to market calves. These items were analyzed using frequencies and percentages.

In any survey design, the major source of bias is a result of non-response (Warde, 1990). “Non-response occurs when an element of the sample fails to provide data to the researcher (Warde, 1990, p. 91). However, direct contact made with respondents in person should decrease non-response. Compared to mailings or phone interviews, most respondents will find time to respond to questions when direct contact is made (Warde, 1990). Due to the chosen data collection method as well as the accessibility issues within the specified population and anonymity of the respondents, the researcher was unable to compare early and late respondents (Lindner, Murphy, & Briers, 2001) or contact non-respondents.

CHAPTER IV

FINDINGS

Chapter IV describes the findings and results of this research study. The results will be discussed in the order of the study's objectives.

Findings Related to Objective One

Objective one sought to describe specific characteristics of selected Angus bull buyers, including state of residence, age, sex, education, type of producer, marketing practices, number of cattle owned or managed, Angus bulls sold or bought annually, and Angus-influenced calves sold at weaning.

Respondents ($f = 292$, 98.3%) provided their state of residence (see Table 1). Twelve percent ($f = 35$) of respondents were from Oklahoma, and 11.3% ($f = 33$) were from Kansas. The following states had no representation from the respondents: Alaska, Delaware, Hawaii, Louisiana, Maine, Massachusetts, Nevada, New Hampshire, New Jersey, Rhode Island, Utah, and Vermont. Five participants (1.7%) did not respond.

Table 1

Respondents' State of Residence (n = 292)

State	<i>f</i>	%
Oklahoma	35	12.0
Kansas	33	11.3
South Carolina	24	8.2
Missouri	21	7.2
North Carolina	18	6.2
Georgia	16	5.5
Tennessee	16	5.5
Texas	14	4.8
Iowa	11	3.8
Ohio	8	2.7
Virginia	8	2.7
Arkansas	6	2.1
Illinois	6	2.1
Montana	6	2.1
North Dakota	6	2.1
West Virginia	6	2.1
Indiana	5	1.7
Pennsylvania	5	1.7
Washington	5	1.7
Idaho	4	1.4
Mississippi	4	1.4
Alabama	3	1.0
Colorado	3	1.0
Florida	3	1.0
Kentucky	3	1.0
Michigan	3	1.0
Arizona	2	0.7
Maryland	2	0.7
Minnesota	2	0.7
Nebraska	2	0.7
New Mexico	2	0.7
Wisconsin	2	0.7
Canada	2	0.7
California	1	0.3
Connecticut	1	0.3
New York	1	0.3
Oregon	1	0.3
South Dakota	1	0.3
Wyoming	1	0.3

The mean age of the respondents was 53.21 ($f = 293$; $SD = 14.676$). The youngest respondent was 20, and the eldest was 83 years old. Of the participants who responded to the question regarding sex ($f = 293$), 85.32% ($f = 250$) were male and 14.68% ($f = 43$) were female. Four participants (1.3%) did not respond.

Regarding their education, participants were asked to report the highest level of education they had completed (see Table 2). At least 68.5% of respondents had a bachelor's degree or higher. Five participants (1.3%) did not respond.

Table 2

Education of Respondents (n = 292)

Education Level	<i>f</i>	%
Bachelor's degree	140	48.0
High school graduate, diploma or equivalent (GED, etc.)	57	19.5
Master's degree	44	15.1
Associate's degree	32	11.0
Professional degree (DVM, MD, etc.)	8	2.7
Doctoral degree	8	2.7
Some high school, no diploma	3	1.0

Respondents were asked what sector of the cattle industry best described their operations (see Table 3). Seedstock producers ($f = 159$) and commercial cow/calf producers ($f = 123$) represented 95.9% of the respondents. Three participants (1.0%) did not respond.

Table 3

Sector of Cattle Industry That Describes Respondents' Operations (n = 294)

Type of Producer	<i>f</i>	%
Seedstock producer	159	54.1
Commercial cow/calf producer	123	41.8
Other	7	2.4
Feedlot operator	3	1.0
Stocker/Backgrounder	2	0.7

Marketing practices were determined by the method of marketing calves and how replacement females were generated for respondents' herds. The questions allowed respondents to "check all that apply." Of the responses for the several options of marketing calves, respondents' primary choice was the local sale barn ($f = 168$, 57.5%), and five participants (1.7%) did not respond (see Table 4).

Table 4

Respondents Methods to Market Their Calves

Method	<i>f</i>	%
Local sale barn	168	57.5
Other	119	40.8
Video auction	59	20.2
Direct sale to feedlot	42	14.4
Direct sale to backgrounder	36	12.3

Of the *Other* responses, 43 responses listed private treaty. Additionally, respondents listed production sales, retain ownership through feedlot, consignment sales, consumer/freezer beef, group sales, and online sales in the this category (see Table 5).

Table 5

Other Responses for Marketing Calves (n = 119)

Method	<i>f</i>	%
Private treaty	48	40.3
Production sale	31	26.1
Retain ownership through feedlot	22	18.5
Consignment sales	10	8.4
Consumer/freezer beef	4	3.4
Group sales	2	1.7
Online	2	1.7

Of the respondents who answered the question regarding generated replacement females, 1.7% indicated *Other*. Only two participants who selected *Other* gave a method of replacing females, which was buying embryos. The participants could “check all that apply,” and 95.9 % (*f* = 281) produce their own heifers and keep them. Four participants (1.3%) did not respond to this item (see Table 6).

Table 6

Methods used by Respondents to Replace Females in Their Herds

Method	<i>f</i>	%
Produce my own and keep	281	95.9
Purchase from special sales	94	32.1
Purchase privately from breeder	86	29.4
Other	5	1.7

The questions pertaining to the number of cattle owned or managed, Angus bulls sold or bought annually, and Angus-influenced calves sold at weaning were open-ended responses. Means and standard deviations were analyzed for each item. Respondents' ($f = 278$) mean number of cattle owned was 267.527 ($SD = 497.13$) with a range of zero to 5,000. Respondents' ($f = 275$) mean number of cattle managed was 194.12 ($SD = 1406.15$) with a range of zero to 20,000. The mean number of Angus bulls sold annually was 40.77 ($SD = 149.80$) by respondents ($f = 278$) with a range of zero to 2,300. The mean number of Angus bulls bought annually was 2.47 ($f = 277$; $SD = 7.17$) of 277 respondents with a range of zero to 100. The mean number of Angus-influenced calves sold at weaning was 100.08 ($SD = 288.29$) by respondents ($f = 272$) with a range of zero to 3,500.

Findings Related to Objective Two

Objective two sought to describe the usefulness of individual bull performance data in a bull sale catalog as perceived by selected Angus bull buyers. Preferred performance information was determined by assessing the usefulness of performance traits in making bull-buying decisions. No items were reported useless. Based on mean values of data collected, no traits were “very useful”; however, several traits can be considered “useful,” including Calving Ease Direct (CED), Birth Weight EPD (BW), Weaning Weight EPD (WW), Yearling Weight EPD (YW), Scrotal Circumference EPD (SC), Docility (Doc), Maternal Milk EPD (Milk), Marbling EPD (Marb), Ribeye Area EPD (RE), Weaned Calf Value (\$W), and Beef Value (\$B) (see Table 7).

Table 7

Usefulness of Performance Traits in Making Bull-buying Decisions: Descriptives

Trait	<i>f</i>	<i>Mean</i>	<i>Mode</i>	<i>SD</i>
Calving Ease Direct (CED)	290	5.48	6	0.923
Weaning Weight EPD (WW)	291	5.32	6	0.932
Yearling Weight EPD (YW)	293	5.32	6	0.954
Birth Weight EPD (BW)	297	5.30	6	1.001
Ribeye Area EPD (RE)	289	5.13	6	0.984
Docility (Doc)	291	5.12	6	1.020
Marbling EPD (Marb)	290	5.11	6	0.989
Beef Value (\$B)	287	5.08	6	1.150
Scrotal Circumference EPD (SC)	286	5.06	6	0.975
Maternal Milk EPD (Milk)	289	4.96	5	1.010
Weaned Calf Value (\$W)	290	4.92	6	1.118
Actual Birth Weight (Act BW)	293	4.83	6	1.352
Adjusted Weaning Weight (Adj WW)	290	4.79	5	1.172
Adjusted Yearling Weight (Adj YW)	291	4.78	5	1.177
Adjusted Ribeye (Adj REA)	290	4.69	5	1.104
Calving Ease Maternal (CEM)	291	4.67	5	1.145
Adjusted Yearling Scrotal Circumference (Adg Yrlg SC)	286	4.62	5	1.089
Heifer Pregnancy (HP)	289	4.60	5	1.178
Carcass Weight EPD (CW)	285	4.58	4	1.147
Adjusted % Intramuscular Fat (Adj % IMF)	289	4.56	5	1.132
Fat Thickness EPD (Fat)	285	4.54	4	1.111
Feedlot Value (\$F)	290	4.51	5	1.195
Yield Grade (\$YG)	285	4.51	5	1.209
Quality Grade (\$QG)	289	4.45	5	1.204
Residual Average Daily Gain (RADG)	282	4.40	5	1.187
Grid Value (\$G)	287	4.37	4	1.219
Adjusted Rib Fat (Adj Rib Fat)	289	4.34	5	1.156
Mature Weight EPD (MW)	284	4.21	4	1.176
Cow Energy Value Index (\$EN)	284	4.20	4	1.276
Adjusted Yearling Hip Height (YH) or Frame Score (FS)	289	4.18	4	1.270
Mature Height EPD (MH)	282	4.10	4	1.201
Yearling Height EPD (YW)	285	4.09	4	1.195
Daughters (MkD)	280	4.01	4	1.176
Herds (MkH)	282	3.81	4	1.273

Note: The following scale was used for these items: 1 = very useless; 2 = useless; 3 = somewhat useless; 4 = somewhat useful; 5 = useful; and 6 = very useful.

Other forms of performance information related to performance traits were analyzed, and all four areas of information were at least “useful” based on mean values. None of the items were reported useless (see Table 8).

Table 8

Preferred Performance Information: Usefulness of Performance Information in Making Bull-buying Decisions

Performance Information	<i>f</i>	<i>Mean</i>	<i>Mode</i>	<i>SD</i>
Accuracy (ACC) values on EPDs	277	5.05	6	1.109
Individual Ratios	280	4.89	5	1.068
Genomic Profile Results (Zoetis HD 50K or GeneSeek GGP-HD)	286	4.80	6	1.213
Percentile Ranks	289	4.75	5	1.028

Based on modal information, several traits were “very useful,” since they had a mode of six including Calving Ease Direct (CED), Birth Weight EPD (BW), Weaning Weight EPD (WW), Yearling Weight EPD (YW), Scrotal Circumference EPD (SC), Docility (Doc), Marbling EPD (Marb), Ribeye Area EPD (RE), Weaned Calf Value (\$W), Beef Value (\$B), and Actual Birth Weight (Act BW) (see Table 9). Other forms of performance information were analyzed and Accuracy (ACC) values on EPDs and Genomic Profile Results (Zoetis HD 50K or GeneSeek GGP-HD) reported “very useful” based on modal information (see Table 10).

Table 9

Usefulness of Performance Traits in Making Bull-buying Decisions: Frequencies

Trait	Level of Usefulness									
	Very Useless		Useless		Somewhat Useless		Somewhat Useful		Useful	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Calving Ease Direct (CED)	5	1.7	0	0.0	3	1.0	28	9.7	60	20.7
Yearling Weight EPD (YW)	5	1.7	0	0.0	5	1.7	36	12.3	87	29.7
Birth Weight EPD (BW)	6	2.0	1	0.3	7	2.4	30	10.1	92	31.0
Weaning Weight EPD (WW)	4	1.4	1	0.3	6	2.1	30	10.3	95	32.6
Beef Value (\$B)	5	1.7	4	1.4	20	7.0	44	15.3	74	25.8
Docility (Doc)	1	0.3	5	1.7	12	4.1	59	20.3	76	26.1
Ribeye Area EPD (RE)	2	0.7	5	1.7	11	3.8	40	13.8	108	37.4
Marbling EPD (Marb)	3	1.0	3	1.0	10	3.4	49	16.9	103	35.5
Scrotal Circumference EPD (SC)	2	0.7	2	0.7	13	4.5	56	19.6	99	34.6
Actual Birth Weight (Act BW)	17	5.8	5	1.7	16	5.5	48	16.4	94	32.1
Weaned Calf Value (\$W)	7	2.4	4	1.4	11	3.8	66	22.8	97	33.4
Adjusted Yearling Weight (Adj YW)	8	2.7	8	2.7	16	5.5	64	22.0	107	36.8
Maternal Milk EPD (Milk)	2	0.7	6	2.1	11	3.8	64	22.1	106	36.7
Adjusted Weaning Weight (Adj WW)	8	2.8	8	2.8	14	4.8	66	22.8	106	36.6
Adjusted Yearling Scrotal Circumference (Adj Yrlg SC)	3	1.0	6	2.1	35	12.2	74	25.9	104	36.4
Adjusted Ribeye (Adj REA)	4	1.4	8	2.8	23	7.9	78	26.9	103	35.5
Yield Grade (\$YG)	8	2.8	10	3.5	33	11.6	73	25.6	100	35.1
Residual Average Daily Gain (RADG)	6	2.1	12	4.3	40	14.2	80	28.4	92	32.6
Adjusted % Intramuscular Fat (Adj % IMF)	4	1.4	10	3.5	30	10.4	87	30.1	93	32.2
									65	22.5

Table 9 - *continued*

Trait	Level of Usefulness											
	Very Useless			Useless			Somewhat Useless			Somewhat Useful		
	<i>f</i>	%		<i>f</i>	%		<i>f</i>	%		<i>f</i>	%	
Feedlot Value (\$F)	8	2.8		8	2.8		34	11.7		83	28.6	
Calving Ease Maternal (CEM)	5	1.7		6	2.1		30	10.3		77	26.5	
Quality Grade (\$QG)	8	2.8		10	3.5		36	12.5		84	29.1	
Heifer Pregnancy (HP)	4	1.4		13	4.5		27	9.3		83	28.7	
Mature Weight EPD (MW)	5	1.8		17	6.0		45	15.8		109	38.4	
Daughters (MkD)	8	2.9		20	7.1		54	19.3		105	37.5	
Herds (MkH)	17	6.0		24	8.5		59	20.9		105	37.2	
Mature Height EPD (MH)	7	2.5		16	5.7		58	20.6		104	36.9	
Yearling Height EPD (YW)	7	2.5		18	6.3		57	20.0		101	35.4	
Adjusted Rib Fat (Adj Rib Fat)	6	2.1		14	4.8		35	12.1		101	34.9	
Fat Thickness EPD (Fat)	5	1.8		6	2.1		31	10.9		92	32.3	
Cow Energy Value Index (\$EN)	12	4.2		16	5.6		43	15.1		91	32.0	
Grid Value (\$G)	9	3.1		10	3.5		40	13.9		89	31.0	
Carcass Weight EPD (CW)	5	1.8		6	2.1		33	11.6		86	30.2	
Adjusted Yearling Hip Height (YH) / Frame Score (FS)	10	3.5		14	4.8		59	20.4		87	30.1	

Note. Mode in boldface.

Table 10

Preferred Performance Information: Usefulness of Traits in Making Bull-buying Decisions

Type of Performance Information	Level of Usefulness											
	Very Useless		Useless		Somewhat Useless		Somewhat Useful		Useful		Very Useful	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Accuracy (ACC) values on EPDs	5	1.8	6	2.2	11	4.0	44	15.9	93	33.6	118	42.6
Genomic Profile Results (Zoetis HD 50K or GeneSeek GGP-HD)	7	2.4	9	3.1	21	7.3	57	19.9	95	33.2	97	33.9
Percentile Ranks	4	1.4	6	2.1	19	6.6	64	22.1	132	45.7	64	22.1
Individual Ratios	2	0.7	7	2.5	21	7.5	52	18.6	107	38.2	91	32.5

Note. Mode in boldface.

Findings Related to Objective Three

Objective Three sought to describe selected Angus bull buyers' format preferences for a bull sale catalog. When asked what format participants preferred viewing a bull sale catalog, 65.0% ($f = 193$) prefer both printed copy and online version, 31.6% ($f = 94$) prefer printed copy only, and 3.4% ($f = 10$) prefer online version only.

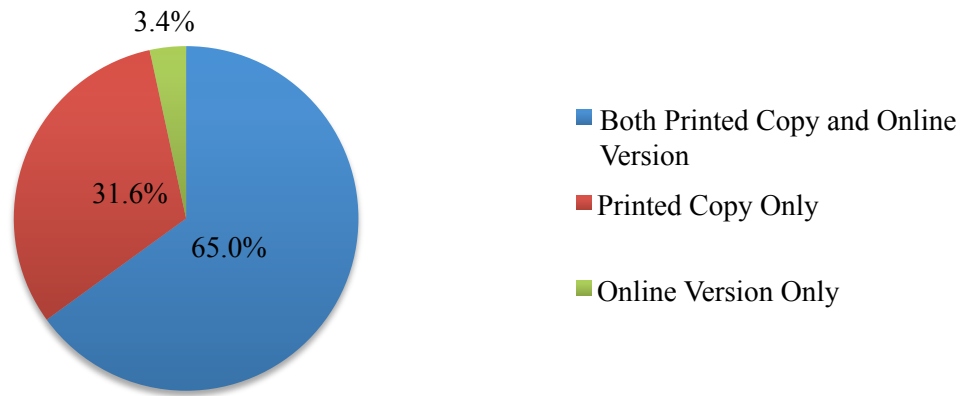


Figure 1. Respondents' preferences for viewing bull sale catalogs.

Photos often are placed in bull sale catalogs, and respondents were asked which type of sale catalog photos they prefer to view when making bull-buying decisions in a “check all that apply” question. Regarding types of photos preferred, 245 respondents (82.5%) reported the photo of animal being sold (see Table 11).

Table 11

Type of Sale Catalog Photos Preferred When Making Bull-buying Decisions (n = 297)

Type of Photo	<i>f</i>	%
Photo of animal being sold	245	82.5
Photo of dam of animal being sold	127	42.8
Photo of sire of animal being sold	101	34.0
Additional reference photos (maternal or paternal siblings, granddam, etc.)	53	17.8
No photos used in bull-purchasing decisions	35	11.8

Of the 35 respondents who selected they did not use photos in bull-purchasing decision, 20 respondents listed reasons (see Table 12). The most common of the listed reasons from eleven respondents (55%) was they would rather see the animal in person before making bull-buying decisions.

Table 12

Respondents' Reasons for Not Using Photos (n = 20)

Reason	<i>f</i>	%
Rather see in person	11	55%
Manipulated	4	20%
Only use EPDs	3	15%
Unnecessary information	2	10%

Participants were asked to indicate their level of agreement of the statements using a six-point scale. Descriptive data was analyzed (see Table 13) determining the mean, mode, and standard deviation for each statement. Based on mean values, respondents agree that sale order should follow catalog order and somewhat disagree that a pamphlet with minimal bull information would be sufficient if it provided active links to the full online sale catalog.

Table 13

Respondents' Preferred Sale Catalog Format: Descriptives

Statement	<i>f</i>	<i>Mean</i>	<i>Mode</i>	<i>SD</i>
Sale order should follow catalog order.	290	4.99	6	1.380
I am more likely to purchase a bull that has genomic-enhanced EPDs available.	287	4.80	6	1.206
Definitions, such explanations of the data presented, are important.	287	4.73	5	1.095
Full and/or half brothers should be cataloged together.	292	4.63	5	1.169
A concise chart with a summary of the performance of all bulls selling would be beneficial.	289	4.59	5	1.047
Performance information for the sire of the bull selling is needed in catalog.	288	4.58	5	1.073
Performance information for the dam of the bull selling is needed in catalog.	289	4.53	5	1.014
Footnotes on each animal are needed to make bull-buying decisions.	284	4.03	4	1.287
Video links of bulls being sold influence my bull-buying decisions.	290	3.92	4	1.389
Color bull sale catalogs are preferred when viewing information.	290	3.81	4	1.426
Pedigree information plays a more significant role than performance information.	290	3.80	4	1.323
Candid photos within the catalog of ranch/farm activities provide useful information.	289	3.64	4	1.334
A pamphlet with minimal bull information would be sufficient if it provided active links to the full online sale catalog.	286	3.17	4	1.395

Note: The following scale was used for these items: 1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; and 6 = strongly agree.

Modal information was reported using frequencies and percentages of each statement based on level of agreement (see Table 14). More than half the respondents ($f = 154$, 51.9%) strongly agree sale order should follow catalog order. On the opposite end, 55.9% of the respondents disagreed that a pamphlet with minimal bull information would be sufficient if it provided active links to the full online sale catalog.

Table 14

Respondents' Preferred Sale Catalog Format: Frequencies

Statement	Level of Agreement									
	Strongly Disagree		Disagree		Somewhat Disagree		Somewhat Agree		Agree	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Sale order should follow catalog order.	10	3.4	13	4.5	21	7.2	35	12.1	57	19.2
I am more likely to purchase a bull that has genomic-enhanced EPDs available.	6	2.1	9	3.1	25	8.7	54	18.8	96	33.4
A concise chart with a summary of the performance of all bulls selling would be beneficial.	4	1.4	7	2.4	25	8.7	85	29.4	115	39.8
Definitions, such explanations of the data presented, are important.	3	1.0	13	4.5	14	4.9	71	24.7	114	39.7
Performance information for the dam of the bull selling is needed in catalog.	0	0.00	12	4.2	26	9.0	97	33.6	104	36.0
Performance information for the sire of the bull selling is needed in catalog.	4	1.4	10	3.5	19	6.6	95	33.0	103	35.8
Full and/or half brothers should be cataloged together.	6	2.1	11	3.8	23	7.9	77	26.4	102	34.9
Candid photos within the catalog of ranch/farm activities provide useful information.	24	8.3	35	12.1	58	20.1	98	33.9	53	18.3
Footnotes on each animal are needed to make bull-buying decisions.	13	4.6	26	9.2	43	15.1	90	31.7	81	28.5
Video links of bulls being sold influence my bull-buying decisions.	21	7.2	29	10.0	45	15.5	85	29.3	77	26.6
Color bull sale catalogs are preferred when viewing information.	18	6.2	43	14.8	51	17.6	79	27.2	61	21.0
Pedigree information plays a more significant role than performance information.	16	5.5	29	10.0	74	25.5	78	26.9	63	21.7
A pamphlet with minimal bull information would be sufficient if it provided active links to the full online sale catalog.	39	13.6	65	22.7	56	19.6	69	24.1	48	16.8
<i>Note.</i> Mode in boldface.										

Findings Related to Objective Four

Objective four sought to determine differences between types of producer in reference to their catalog preferences. Seedstock producers and commercial cow/calf producers were analyzed to determine differences between them. These two sectors were chosen since they represented 95.9% ($f = 282$) of the sample. Statistical significance was determined *a priori* as $p < .05$.

Significant differences existed between seedstock producers and commercial cow/calf producers for 12 performance traits (see Table 15 and Table 16): Residual Average Daily Gain ($t = -3.322, p = .001$), Scrotal Circumference EPD ($t = 2.737, p = .007$), Heifer Pregnancy ($t = -3.668, p = .000$), Calving Ease Maternal ($t = -3.647, p = .000$), Mature Weight EPD ($t = -3.971, p = .000$), Mature Height EPD ($t = -2.707, p = .007$), Cow Energy Value Index ($t = -2.864, p = .005$), Feedlot Value ($t = -3.486, p = .001$), Quality Grade ($t = -3.367, p = .001$), Yield Grade ($t = -3.091, p = .002$), Adjusted Yearling Hip Height or Frame Score ($t = -2.304, p = .022$), and Adjusted Rib Fat ($t = -2.403, p = .017$).

Significant differences existed between seedstock producers and commercial cow/calf producers for seven format preferences (see Table 17): sale order should follow catalog order ($t = -4.681, p = .000$); footnotes on each animal are needed to make bull-buying decisions ($t = -2.791, p = .006$); color bull sale catalogs are preferred when viewing information ($t = -3.247, p = .001$); candid photos within the catalog of farm/ranch activities provide useful information ($t = -2.598, p = .010$); definitions, such as explanations of the data presented, are important ($t = -4.639, p = .000$); a concise chart with a summary of the performance of all bulls selling would be beneficial ($t = -3.284, p = .001$); performance information for the sire of the bull selling is needed in the catalog ($t = -2.312, p = .022$).

Table 15

Differences of Seedstock and Commercial Cow/Calf Producers of Preferred Performance Information: Usefulness of Traits in Making Bull-buying Decisions

Trait	Seedstock Producer			Commercial Cow/Calf Producer			<i>t</i>	<i>p</i> -value
	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>		
Heifer Pregnancy (HP)	154	4.36	1.176	120	4.88	1.154	-3.668	.000
Calving Ease Maternal (CEM)	156	4.47	1.133	120	4.96	1.088	-3.647	.000
Mature Weight EPD (MW)	152	3.94	1.169	117	4.50	1.142	-3.971	.000
Residual Average Daily Gain (RADG)	151	4.19	1.170	117	4.67	1.152	-3.322	.001
Feedlot Value (\$F)	156	4.30	1.194	119	4.79	1.119	-3.486	.001
Quality Grade (\$QG)	155	4.25	1.192	119	4.72	1.142	-3.367	.001
Yield Grade (\$YG)	153	4.32	1.239	117	4.76	1.096	-3.091	.002
Cow Energy Value Index (\$EN)	152	4.01	1.289	117	4.44	1.207	-2.864	.005
Scrotal Circumference EPD (SC)	153	5.20	.876	118	4.87	1.059	2.737	.007
Mature Height EPD (MH)	151	3.90	1.147	116	4.30	1.239	-2.707	.007
Adjusted Rib Fat (Adj Rib Fat)	154	4.19	1.126	120	4.53	1.195	-2.403	.017
Adjusted Yearling Hip Height (YH) or Frame Score (FS)	154	4.00	1.210	120	4.36	1.327	-2.304	.022
Grid Value (\$G)	155	4.25	1.236	117	4.54	1.164	-1.943	.053
Herds (MkH)	154	3.70	1.269	113	3.99	1.236	-1.865	.063
Docility (Doc)	154	5.01	1.072	122	5.23	.969	-1.738	.083
Marbling EPD (Marb)	155	5.20	.915	120	4.99	1.088	1.724	.086
Yearling Weight EPD (YW)	157	5.42	.892	121	5.23	.973	1.683	.093
Weaning Weight EPD (WW)	157	5.43	.879	119	5.25	.913	1.608	.109
Yearling Height EPD (YW)	153	3.98	1.127	117	4.20	1.254	-1.487	.138
Daughters (MkD)	153	3.93	1.128	112	4.13	1.219	-1.373	.171
Ribeye Area EPD (RE)	155	5.21	.958	119	5.05	1.040	1.287	.199
Fat Thickness EPD (Fat)	154	4.49	1.062	116	4.64	1.145	-1.070	.286

Table 15 (continued)

Trait	Seedstock Producer				Commercial Cow/Calf Producer			
	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> -value
Adjusted Yearling Scrotal Circumference (Adg Yrlg SC)	153	4.69	1.003	118	4.56	1.181	.956	.340
Adjusted Ribeye (Adj REA)	155	4.63	1.117	120	4.76	1.100	-.935	.351
Birth Weight EPD (BW)	159	5.35	.956	123	5.24	1.074	.894	.372
Carcass Weight EPD (CW)	151	4.51	1.107	120	4.63	1.217	-.813	.417
Actual Birth Weight (Act BW)	156	4.78	1.408	122	4.89	1.331	-.660	.510
Calving Ease Direct (CED)	154	5.45	.964	121	5.53	.895	-.655	.513
Adjusted % Intramuscular Fat (Adj % IMF)	153	4.53	1.153	121	4.60	1.107	-.476	.634
Beef Value (\$B)	154	5.13	1.118	118	5.07	1.153	.448	.655
Weaned Calf Value (\$W)	154	4.93	1.049	121	4.98	1.144	-.352	.725
Maternal Milk EPD (Milk)	153	4.95	.972	121	4.97	1.048	-.157	.875
Adjusted Weaning Weight (Adj WW)	156	4.79	1.179	119	4.77	1.217	.150	.881
Adjusted Yearling Weight (Adj YW)	156	4.78	1.211	120	4.78	1.191	.004	.996

Note. $p < .05$ used “equal variances not assumed” values for t-score and p-value.

Table 16

Differences of Seedstock and Commercial Cow/Calf Producers of Preferred Performance Information- Usefulness of Performance Information in Making Bull-buying Decisions

Type of Performance Information	Seedstock Producer				Commercial cow/calf Producer			
	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> - value
Accuracy (ACC) values on EPDs	146	4.95	1.141	116	5.13	1.092	-1.273	.204
Percentile Ranks	156	4.71	.972	118	4.86	1.048	-1.229	.220
Individual Ratios	152	4.93	1.021	113	4.81	1.148	.964	.336
Genomic Profile Results (Zoetis HD 50K or GeneSeek GGP-HD)	154	4.82	1.227	117	4.79	1.164	.203	.840

Note. *p* < .05 used “equal variances not assumed” values for t-score and p-value.

Table 17

Preferred Catalog Format in Making Bull-buying Decisions: Differences Between Seedstock and Commercial Cow/Calf Producers

Statement	Seedstock Producer			Commercial Cow/Calf Producer			<i>t</i>	<i>p</i> -value
	<i>f</i>	<i>M</i>	<i>SD</i>	<i>f</i>	<i>M</i>	<i>SD</i>		
Sale order should follow catalog order.	154	4.64	1.520	121	5.38	1.090	-4.681	.000
Definitions, such explanations of the data presented, are important.	153	4.48	1.113	120	5.06	.955	-4.639	.000
Color bull sale catalogs are preferred when viewing information.	156	3.56	1.326	120	4.12	1.485	-3.247	.001
A concise chart with a summary of the performance of all bulls selling would be beneficial.	156	4.47	1.089	119	4.82	.920	-3.284	.001
Footnotes on each animal are needed to make bull-buying decisions.	153	3.84	1.254	117	4.27	1.291	-2.791	.006
Candid photos within the catalog of ranch/farm activities provide useful information.	155	3.45	1.387	120	3.86	1.197	-2.598	.010
Performance information for the sire of the bull selling is needed in catalog.	156	4.44	1.176	118	4.75	.926	-2.312	.022
Video links of bulls being sold influence my bull-buying decisions.	155	3.99	1.360	121	3.78	1.452	1.275	.203
Pedigree information plays a more significant role than performance information.	156	3.72	1.380	120	3.88	1.291	-.976	.330
Performance information for the dam of the bull selling is needed in catalog.	156	4.49	1.038	119	4.61	.985	-.954	.341
Full and/or half brothers should be cataloged together.	155	4.58	1.258	122	4.67	1.079	-.639	.523
A pamphlet with minimal bull information would be sufficient if it provided active links to the full online sale catalog.	153	3.16	1.343	120	3.20	1.459	-.254	.800
I am more likely to purchase a bull that has genomic-enhanced EPDs available.	156	4.81	1.291	117	4.79	1.081	.145	.885

Note. $p < .05$ used “equal variances not assumed” values for t-score and p-value.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

This chapter includes the researcher's conclusions from the study, implications, recommendations for practice, recommendations for future research, and a related discussion section.

Conclusions and Implications Related to Objective One

Objective one sought to describe specific characteristics (state of residence, age, sex, education, type of producer, marketing practices and number of cattle owned or managed, Angus bulls sold or bought annually, and Angus-influenced calves sold at weaning) of selected Angus bull buyers.

The top four states of response were Oklahoma, Kansas, South Carolina, and Missouri and respondents represented all regions of the United States. The typical respondent was a 53-year-old male with a bachelor's degree or higher. This finding supports U. S. Department of Agriculture 2012 Census of Agriculture that reported the average age of beef cattle operators is 58.3 and 86% are male (Cattle Industry Highlights, 2015). Traditionally farm and/or ranch experience coupled with a high school diploma provided the education criteria needed for farmers and ranchers; however, today, more farmers and ranchers have a bachelor's degree in agriculture or a related field due to advancements in farm management (Farmers, Ranchers, and Other Agricultural Managers, 2014).

The typical respondent was also a seedstock producer who markets his calves at the local sale barn. He produces his own females and retains them as herd replacements. This producer owns 268 head of cattle and/or manages 194 head of cattle. Annually, he sells 41 head of Angus bulls, buys two to three Angus bulls, and sells 100 head of Angus-influenced calves at weaning.

Conclusions and Implications Related to Objective Two

Objective two sought to describe the usefulness of individual bull performance data in a bull sale catalog as perceived by selected Angus bull buyers.

Respondents perceived some level of usefulness for all performance traits when used in making bull-buying decisions. Calving Ease Direct (CED), Birth Weight EPD (BW), Weaning Weight EPD (WW), Yearling Weight EPD (YW), Scrotal Circumference EPD (SC), Docility (Doc), Marbling EPD (Marb), Maternal Milk EPD (Milk), Ribeye Area EPD (RE), Weaned Calf Value (\$W), Beef Value (\$B), and Actual Birth Weight (Act BW) are traits respondents found the most useful of available performance traits. Less useful traits were Yearling Height EPD (YW), Herds (MkH), Daughters (MkD), Mature Weight EPD (MW), Mature Height EPD (MH), Cow Energy Value Index (\$EN), Carcass Weight EPD (CW), Fat Thickness EPD (Fat), Grid Value (\$G), and Adjusted Yearling Hip Height (YH) or Frame Score (FS). These results support research conducted by Dhuyvetter, Turner, Marston, and Jones (1994), which found multiple EPD traits had significant influence to price: Birth Weight EPD (BW), Weaning Weight EPD (WW), Yearling Weight EPD (YW), Maternal Milk EPD (Milk), and Ribeye Area EPD (RE).

Respondents perceived some level of usefulness for all other types of performance information, and Accuracy (ACC) values on EPDs was perceived as being the most useful. Genomic Profile Results (Zoetis HD 50K or GeneSeek GGP-HD), Individual Ratios, and Percentile Ranks are useful in making bull-buying decisions. This is contrary to an economic study by Vestal, Lusk, DeVuyst, and Kropp (2013), which concluded genetic information and DNA results were not influential on sale prices. With data for the Vestal, et al. study collected in

2009 and 2010 at a multiple-breed sale, it could be their study occurred before general acceptance of these specific DNA tests and the buyers were tied less specifically to the Angus breed.

Conclusions and Implications Related to Objective Three

Objective three sought to describe selected Angus bull buyers' format preferences for a bull sale catalog.

Respondents preferred viewing bull sale catalogs with a combination of a printed copy and online version, rather than either option independently. Respondents preferred a photo of the animal being sold to be included in the catalog when making bull-buying decisions. This supports Dhuyvetter, Schroeder, Simms, Bolze, and Geske (1996), who found bulls with pictures in the sale catalog receive higher premiums to those without.

Respondents preferred sale order follow catalog order of bulls being sold, which is comparable with Dhuyvetter, et al., who found sale order affects price as prices decline as the sale progresses. Also, respondents are more likely to purchase bulls that have genomic-enhanced EPDs available. They prefer full and/or half brothers are cataloged together. Definitions, such as explanations of the data presented, should be included in the sale catalog for these respondents, but a concise chart with a summary of the performance of all bulls selling would be beneficial. Performance information of the sire and dam is needed in the catalog to make bull-buying decisions.

According to respondents, a pamphlet with minimal bull information is insufficient to make bull-buying decisions, even if it provides active links to full, online sale catalog. Color bull sale catalogs are preferred when viewing information, candid photos within the catalog of ranch/farm activities provide useful information, and pedigree information plays a more significant role than performance information when selecting a bull. Footnotes on each animal are needed or video links of bulls being sold influence bull-buying decisions.

Conclusions and Implications Related to Objective Four

Objective four sought to determine differences in catalog preferences between commercial cow/calf producers and seedstock producers. Seedstock producers and commercial cow/calf producers differ in their perceived usefulness of 12 performance traits. Seedstock producers found Scrotal Circumference EPD more useful than did commercial cow/calf producers. Commercial cow/calf producers perceive eleven performance traits as more useful than do seedstock producers, including Residual Average Daily Gain (RADG), Heifer Pregnancy (HP), Calving Ease Maternal (CEM), Mature Weight EPD (MW), Mature Height EPD (MH), Cow Energy Value Index (\$EN), Feedlot Value (\$F), Quality Grade (\$QG), Yield Grade (\$YG), Adjusted Yearling Hip Height or Frame Score ((FS), and Adjusted Rib Fat (Adj Rib Fat). However, commercial cow/calf producers and seedstock producers perceive performance information — Accuracy (ACC) values on EPDs, Genomic Profile Results, Percentile Ranks, and Individual Ratios — in like manner.

Significant differences exist between seedstock producers and commercial cow/calf producers for seven format preferences. Commercial cow/calf producers perceive the following statements as more useful than do seedstock producers: (a) sale order should follow catalog order; (b) footnotes on each animal are needed to make bull-buying decisions; (c) color bull sale catalogs are preferred when viewing information; (d) candid photos within the catalog of farm/ranch activities provide useful information; (e) definitions, such as explanations of the data presented, are important; (f) a concise chart with a summary of the performance of all bulls selling would be beneficial; and (g) performance information for the sire of the bull selling is needed in the catalog.

Recommendations for Practice

To address buyers' needs for preferred performance information and format of bull sale catalogs, there are several recommendations for producers creating catalogs to promote their sale offering. Different customers place value on different performance traits, and it is important to recognize the geographical area and needs of specific customer base. This study looks at bull sale

catalogs as a media source and how customer needs can be satisfied through media (Eighmey & McCord, 1998). Uses and gratifications theory states audiences use media to fulfill needs such as gaining information (Danesi, 2008). Although all performance information was perceived useful by respondents; however, from an intuitive perspective, this contradicts Dhuyvetter, et al. (2004), who stated buyer confusion occurs when a large amount of information is printed in the catalog.

Since all traits are considered useful at some level, producers must cater their catalog needs to their specific customer base. However, producers should list Calving Ease Direct (CED), Birth Weight EPD (BW), Weaning Weight EPD (WW), Yearling Weight EPD (YW), Scrotal Circumference EPD (SC), Docility (Doc), Marbling EPD (Marb), Ribeye Area EPD (RE), Weaned Calf Value (\$W), Beef Value (\$B), and Actual Birth Weight (Act BW) in the sale catalog because they were perceived as the most useful. Additionally, if information needs to be omitted from the catalog because of available space, budget or other issues, the following traits are less useful to potential Angus bull buyers and could be excluded: Yearling Height EPD (YW), Herds (MkH), Daughters (MkD), Mature Weight EPD (MW), Mature Height EPD (MH), Cow Energy Value Index (\$EN), Carcass Weight EPD (CW), Fat Thickness EPD (Fat), Adjusted Rib Fat (Adj Rib Fat), Grid Value (\$G), and Adjusted Yearling Hip Height (YH) or Frame Score (FS).

An online version and printed copy should be available to all potential Angus bull buyers. A pamphlet with active links to the full online sale catalog is not a sufficient amount of information to making buying decisions and is not recommended. Sale photos of the bulls being sold should be included in the catalog as well as other reference photos if available; however, color photos are optional.

Since the majority of bull buyers are commercial cow/calf producers (Dhuyvetter, Turner, Marston, & Jones, 2004), their opinions matter. Seedstock producers are the primary decision-makers on catalog design, and they should cater the needs of their commercial customers. Therefore, if a seedstock producer's potential buyers are commercial producers, they

should consider including traits that are more useful for commercial cow/calf producers in their catalog information: Residual Average Daily Gain, Heifer Pregnancy, Calving Ease Maternal, Mature Weight EPD, Mature Height EPD, Cow Energy Value Index, Feedlot Value, Quality Grade, Yield Grade, Adjusted Yearling Hip Height or Frame Score, and Adjusted Rib Fat.

When seedstock producers prepare future Angus bull sale catalogs, they can help potential commercial buyers and possibly their bottom line when they create a full-color catalog that follows the sale order. By including footnotes on each animal, these prospective buyers are better able to make bull-buying decisions. Definitions, such as explanations of the data presented, are useful to commercial bull buyers and should be included in the catalog. A concise chart with a summary of the performance of all bulls selling and performance information for the sire of the bulls selling are helpful to buyers when included in the catalog. The needs of the commercial cattlemen should be met, since they are the majority of seedstock producers' customer base.

Recommendations for Future Research

Similar research should be conducted on a larger scale to include more people from several areas of the country. The three Angus bull sales selected for this study were the largest in their respective states. If this study was expanded in the future, the questionnaire may be distributed at the largest Angus bull sale in each state of the United States.

This study was only relative to the Angus breed, especially when discussing preferred performance information. Performance information, such as EPDs, cannot be compared across different breeds. If this questionnaire were used to determine catalog preferences of other breeds than Angus, questions would have to be modified to describe accurately specific breed characteristics.

The majority of cattle producers and bull buyers in the United States are commercial cow/calf producers (Dhuyvetter, Turner, Marston, & Jones, 2004). It may be beneficial to attend a wider variety of sales with a large commercial customer base as well as the National Cattlemen's Beef Association Annual Convention to learn more about buyer preferences. The NCBA

convention is the largest annual gathering of all types of cattlemen in one location and would be a good place to gather a wide variety of opinions.

Another option for determining the most useful performance traits and EPD values could be to ask buyers to rank them from most useful to least useful. Thirty-eight types of performance information were analyzed in this study, and all were determined useful at some level. If participants were asked to rank them from most useful to least useful when making bull-buying decisions, more differences may be found.

Discussion

Aside from type of producer, respondents were different in their experience and involvement in the beef cattle industry. Preferences were similar, but what factors may have created differences among respondents? Could it be that older cattlemen are not as familiar with newer technologies such as genomically-enhanced EPDs or viewing catalogs online? Technology in the cattle industry is always changing and more tools continuously are added to the toolbox of available information. Future research will be needed to expand on these questions as sale catalogs are produced to meet buyers' needs.

Many seedstock producers have been in the cattle business for several generations and always have created their catalogs in the same manner. Seedstock producers may be more comfortable with more information, not because they are more knowledgeable, but because they use it more intensively in their operations. Are their customers comfortable with the current design and desire no changes to be made? Would a new format and concise information help new buyers better understand the sale offering? Could it be commercial buyers conform to seedstock producers bull sale catalog preferences? If so, perhaps catalog designers should reevaluate how they provide information for commercial cow/calf producers.

The findings of this study indicate respondents desire to have a large amount of information available in sale catalogs when making bull-buying decisions. Cattle producers' marketing efforts evolve over time with progress in available information and technology.

Therefore, determining format and information preferences of bull sale catalogs will be a continuous process.

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APPENDICES

APPENDIX A

Approval of Institutional Review Board

Oklahoma State University Institutional Review Board

Date: Thursday, September 25, 2014
IRB Application No AG1442
Proposal Title: Angus Bull Buyers' Preferences for the Format and Content of Angus Bull Sale Catalogs
Reviewed and Processed as: Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 9/24/2017

Principal Investigator(s):

Sally R. Yon	Shelly Sitton
2531 W 22nd Ave	435 Ag Hall
Stillwater, OK 74074	Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Cordell North (phone: 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,



Hugh Crethar, Chair
Institutional Review Board

ADULT CONSENT FORM
OKLAHOMA STATE UNIVERSITY

PROJECT:

Angus Bull Buyers' Preferences for the Format and Content of Angus Bull Sale Catalogs

INVESTIGATORS:

Sally R. Yon, Agricultural Communications Master of Science student
Shelly Peper Sitton, Professor of Agricultural Communications

PURPOSE:

The purpose of this study is to describe Angus bull buyers' preferences for the format and content of Angus bull sale catalogs.

PROCEDURES

One questionnaire will be given to potential bull buyers at the Gardiner Angus Ranch and Express Ranches upcoming sales. The questionnaire will ask respondents their preferences of a bull sale catalog's format and content. This study is designed to last approximately 10 to 15 minutes.

RISKS OF PARTICIPATION:

There are no known risks associated with this project, which are greater than those ordinarily encountered in daily life.

BENEFITS OF PARTICIPATION:

Participants are expected to benefit from this study's results as seedstock producers creating catalogs in the future may reference this study and provide information participants wish to have in their sale catalogs.

CONFIDENTIALITY:

Confidentiality of the subjects will be protected, as the participants will not provide their name or contact information when completing the questionnaire.

COMPENSATION:

No compensation.

CONTACTS :

You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study: Sally Yon (cell: 803-312-4837; email: sallyy@okstate.edu) and Shelly Sitton, Ph.D., 448 Agricultural Hall, Dept. of Agricultural Education, Communication, and Leadership, Oklahoma State University, Stillwater, OK 74078, (cell: 405-614-0302; email: shelly.sitton@okstate.edu). If you have questions about your rights as a research volunteer, you may contact the IRB Office at 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

PARTICIPANT RIGHTS:

I understand that my participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation in this project at any time, without penalty.

CONSENT DOCUMENTATION:

I have been fully informed about the procedures listed here. I am aware of what I will be asked to do and of the benefits of my participation. I give my consent by completing the attached questionnaire.

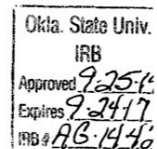
Okla. State Univ.
IRB
Approved <u>9/25/14</u>
Expires <u>9/24/17</u>
IRB # <u>161442</u>

SCRIPT

Good evening, my name is Sally Yon from Ridge Spring, SC. I am a graduate student in the Department of Agricultural Education, Communications and Leadership at Oklahoma State University. We are conducting a survey to determine your preference of bull sale catalog format and content when making bull-buying decisions. This questionnaire is at located at your dinner table this evening. You can complete the questionnaire now or at any time during the remainder of tonight's program. It should take you no longer than 10 to 15 minutes. When you are finished, please leave your survey at your dinner table or place it in the labeled box at the back of the room. Returned questionnaires will be kept in a secured container and in a locked office. I want to stress, this study is completely voluntary and anonymous. If you wish to participate, I greatly thank you for your participation.

REMINDER SCRIPT

This is a brief reminder that we are conducting a survey on the preferences of bull sale catalog format and content when making bull-buying decisions. If you have not already completed the questionnaire, please do so at any time during the remainder of tonight's activities. When you are finished, please place the survey on your table or in the labeled box at the back of the room. Thank you.



APPENDIX B

Modification Approval of Institutional Review Board

Oklahoma State University Institutional Review Board

Date: Wednesday, October 29, 2014 Protocol Expires: 9/24/2017
IRB Application No: AG1442
Proposal Title: Angus Bull Buyers' Preferences for the Format and Content of Angus Bull Sale Catalogs
Reviewed and Exempt
Processed as: **Modification**
Status Recommended by Reviewer(s) **Approved**
Principal Investigator(s):
Sally R. Yon Shelly Sitton
2531 W 22nd Ave 435 Ag Hall
Stillwater, OK 74074 Stillwater, OK 74078

The requested modification to this IRB protocol has been approved. Please note that the original expiration date of the protocol has not changed. The IRB office **MUST** be notified in writing when a project is complete. All approved projects are subject to monitoring by the IRB.

- ☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

The reviewer(s) had these comments:

Modification to expand recruitment to include Gardiner Angus Ranch, Express Ranches customers at bull sales during fall 2014 as well as Yon Family Farms sale and American Angus Association National Convention & Trade Show.

Signature :



Hugh Crethar, Chair, Institutional Review Board

Wednesday, October 29, 2014
Date

APPENDIX C

Instrument

Angus Bull Buyers' Preferences for the Format and Content of Angus Bull Sale Catalogs

Questionnaire

Sally Yon
Candidate for Master of Science

Shelly Peper Sitton, Ph.D.
Professor of Agricultural Communications

Oklahoma State University

Project Information

PURPOSE: The purpose of this study is to describe Angus bull buyers' preferences for the format and content of Angus bull sale catalogs.

PROCEDURES: One questionnaire will be given to potential bull buyers at the Gardiner Angus Ranch, Express Ranches, and Yon Family Farms upcoming sales as well as the American Angus Association National Convention & Trade Show. The questionnaire will ask respondents their preferences of a bull sale catalog's format and content. This study is designed to last approximately 10 to 15 minutes.

RISKS OF PARTICIPATION: There are no known risks associated with this project, which are greater than those ordinarily encountered in daily life.

BENEFITS OF PARTICIPATION: Participants are expected to benefit from this study's results as seedstock producers creating catalogs in the future may reference this study and provide information participants wish to have in their sale catalogs.

CONFIDENTIALITY: Confidentiality of the subjects will be protected, as the participants will not provide their name or contact information when completing the questionnaire.

CONTACTS : You may contact any of the researchers at the following addresses and phone numbers, should you desire to discuss your participation in the study and/or request information about the results of the study: Sally Yon (cell: 803-312-4837; email: sallyy@okstate.edu) and Shelly Sitton, Ph.D., 448 Agricultural Hall, Dept. of Agricultural Education, Communication, and Leadership, Oklahoma State University, Stillwater, OK 74078, (cell: 405-614-0302; email: shelly.sitton@okstate.edu). If you have questions about your rights as a research volunteer, you may contact the IRB Office at 219 Cordell North, Stillwater, OK 74078, 405-744-3377 or irb@okstate.edu

COMPENSATION: No compensation.

PARTICIPANT RIGHTS: I understand that my participation is voluntary, that there is no penalty for refusal to participate, and that I am free to withdraw my consent and participation in this project at any time, without penalty.

CONSENT DOCUMENTATION: I have been fully informed about the procedures listed here. I am aware of what I will be asked to do and of the benefits of my participation. I give my consent by completing the attached questionnaire.

SECTION 1: Preferred Performance Information

Bull sale catalogs include diverse individual performance information on each animal for buyers to use when making purchasing decisions. Please answer the following items based on your preference for available catalog information.

1. How useful are each of the following traits in making your bull-buying decisions?

1 = very useless; 2 = useless; 3 = somewhat useless; 4 = somewhat useful; 5 = useful; 6 = very useful

Calving Ease Direct (CED)	1	2	3	4	5	6
Birth Weight EPD (BW)	1	2	3	4	5	6
Weaning Weight EPD (WW)	1	2	3	4	5	6
Yearling Weight EPD (YW)	1	2	3	4	5	6
Residual Average Daily Gain (RADG)	1	2	3	4	5	6
Yearling Height EPD (YH)	1	2	3	4	5	6
Scrotal Circumference EPD (SC)	1	2	3	4	5	6
Docility (Doc)	1	2	3	4	5	6
Heifer Pregnancy (HP)	1	2	3	4	5	6
Calving Ease Maternal (CEM)	1	2	3	4	5	6
Maternal Milk EPD (Milk)	1	2	3	4	5	6
Herds (MkH)	1	2	3	4	5	6
Daughters (MkD)	1	2	3	4	5	6
Mature Weight EPD (MW)	1	2	3	4	5	6
Mature Height EPD (MH)	1	2	3	4	5	6
Cow Energy Value Index (\$EN)	1	2	3	4	5	6
Carcass Weight EPD (CW)	1	2	3	4	5	6
Marbling EPD (Marb)	1	2	3	4	5	6
Ribeye Area EPD (RE)	1	2	3	4	5	6
Fat Thickness EPD (Fat)	1	2	3	4	5	6
Weaned Calf Value (\$W)	1	2	3	4	5	6
Feedlot Value (\$F)	1	2	3	4	5	6
Grid Value (\$G)	1	2	3	4	5	6
Quality Grade (\$QG)	1	2	3	4	5	6
Yield Grade (\$YG)	1	2	3	4	5	6
Beef Value (\$B)	1	2	3	4	5	6
Adjusted Yearling Hip Height (YH) or Frame Score (FS)	1	2	3	4	5	6
Adjusted Yearling Scrotal Circumference (Adj Yrlg SC)	1	2	3	4	5	6
Adjusted % Intramuscular Fat (Adj % IMF) <i>Ultrasound Measurement</i>	1	2	3	4	5	6
Adjusted Ribeye (Adj REA) <i>Ultrasound Measurement</i>	1	2	3	4	5	6
Adjusted Rib Fat (Adj Rib Fat) <i>Ultrasound Measurement</i>	1	2	3	4	5	6
Actual Birth Weight (Act BW)	1	2	3	4	5	6
Adjusted Weaning Weight (Adj WW)	1	2	3	4	5	6
Adjusted Yearling Weight (Adj YW)	1	2	3	4	5	6

2. How useful is the following performance information in making your bull-buying decisions?

1 = very useless; 2 = useless; 3 = somewhat useless; 4 = somewhat useful; 5 = useful; 6 = very useful

Individual Ratios	1	2	3	4	5	6
Percentile Ranks	1	2	3	4	5	6
Accuracy (ACC) values on EPDs	1	2	3	4	5	6
Genomic Profile Results (Zoetis HD 50K or GeneSeek GGP-HD)	1	2	3	4	5	6

SECTION 2: Preferred Sale Catalog Format

1. In what format would you prefer to view a bull sale catalog? Check only one.

- ☐ Printed copy only
☐ Online version only
☐ Use both

2. Which types of sale catalog photos do you prefer to view as you make bull-buying decisions? Check all that apply.

- ☐ Photo of animal being sold
☐ Photo of dam of animal being sold
☐ Photo of sire of animal being sold
☐ Additional reference photos (maternal or paternal siblings, granddam, etc.)
☐ I do not use photos in my bull-purchasing decisions. Reason: _____

3. Rank your score based on the following scale:

1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; 6 = strongly agree

Sale order should follow catalog order.	1	2	3	4	5	6
Full and/or half brothers should be cataloged together.	1	2	3	4	5	6
A pamphlet with minimal bull information would be sufficient if it provided active links to the full online sale catalog.	1	2	3	4	5	6
Video links of bulls being sold influence my bull-buying decisions.	1	2	3	4	5	6
Footnotes on each animal are needed to make bull-buying decisions.	1	2	3	4	5	6
Color bull sale catalogs are preferred when viewing information.	1	2	3	4	5	6
Candid photos within the catalog of ranch/farm activities provide useful information.	1	2	3	4	5	6
Definitions, such explanations of the data presented, are important.	1	2	3	4	5	6
I am more likely to purchase a bull that has genomic-enhanced EPDs available.	1	2	3	4	5	6
A concise chart with a summary of the performance of all bulls selling would be beneficial.	1	2	3	4	5	6
Performance information for the dam of the bull selling is needed in catalog.	1	2	3	4	5	6
Performance information for the sire of the bull selling is needed in catalog.	1	2	3	4	5	6
Pedigree information plays a more significant role than performance information.	1	2	3	4	5	6

SECTION 3: Demographics

1. State of residence _____
2. What is your age? _____ ☐ Choose not to respond
3. What is your sex?
☐ Male ☐ Female ☐ Choose not to respond
4. What level of school have you completed?
☐ Some high school, no diploma
☐ High school graduate, diploma or equivalent (GED, etc.)
☐ Associate's degree
☐ Bachelor's degree
☐ Master's degree
☐ Professional degree (DVM, MD, etc.)
☐ Doctoral degree
5. What sector of the cattle industry best describes your operation? Check only one.
☐ Seedstock producer
☐ Commercial cow/calf producer
☐ Stocker/ Backgrounder
☐ Feedlot Operator
☐ Other
6. How do you market calves? Check all that apply.
☐ Local sale barn
☐ Video Auction
☐ Direct Sale to Backgrounder
☐ Direct Sale to Feedlot
☐ Other _____
7. How do you generate replacement females? Check all that apply.
☐ Produce my own and keep
☐ Purchase from special sales
☐ Purchase privately from breeder
☐ Other _____
8. If you are a cattle **owner**, approximately how many head of cattle do you own? _____
9. If you are a cattle **manager**, approximately how many head of cattle do you manage for someone else? _____
10. Approximately how many Angus bulls do you **sell** annually? _____
11. Approximately how many Angus bulls do you **buy** annually? _____
12. Approximately how many Angus-influenced calves do you sell at weaning? _____

Thank you for participating in this study.

VITA

Sally Ruth Yon

Candidate for the Degree of

Master of Science

Thesis: ANGUS BULL BUYERS' PREFERENCES FOR THE FORMAT AND
CONTENT OF ANGUS BULL SALE CATALOGS

Major Field: Agricultural Communications

Biographical:

Education:

Completed the requirements for the Master of Science in Agricultural Communications at Oklahoma State University, Stillwater, Oklahoma in May 2015.

Completed the requirements for the Bachelor of Science in your Agricultural Education at Clemson University, Clemson, South Carolina in 2013.

Graduated from Ridge Spring-Monetta High School, Monetta, South Carolina in June 2009.

Experience:

Employed as Summer Intern at Yon Family Farms in 2014 and Clemson Extension Services in 2013.

Employed as Student Worker for CAFLS Student Services Center at Clemson University from August 2009- April 2013.

Employed as Marketing Intern at Certified Angus Beef LLC in Wooster, Ohio for the summer of 2012.

Professional Memberships:

American Angus Association (2012-2015)
South Carolina Cattlemen's Association (1995-2015)
National Junior Angus Association (1998-2013)
South Carolina Farm Bureau (2000-2015)