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Missouri Meat Goat Producers: A Focus Group Approach To Identify Opportunities and Challenges

Samantha N. Riley
Missouri State University, Samantha531@live.missouristate.edu

MISSOURI MEAT GOAT PRODUCERS: A FOCUS GROUP APPROACH TO IDENTIFY OPPORTUNTIES AND CHALLENGES

A Master's Thesis

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Master of Science, Agriculture

By

Samantha Riley

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ABSTRACT

This study was conducted to better understand opportunities and challenges for Missouri meat goat producers. The meat goat industry is expanding and is one of the fastest growing segments of livestock production in the United States, both in inventory and markets for products produced from goats. This study used focus groups as a way to determine what a sampling of producers in Missouri see as opportunities and challenges based on themes and patterns found in the focus groups. The participants in the three focus groups did not always agree with the literature, but they did see the following as opportunities in the meat goat industry: rising demand for goat meat, use of goats for brush control, and multispecies grazing. The participants indicated control of internal parasites, marketing goat meat, and limited expertise and information as challenges. The prolific nature of goats, being less labor intensive and having a low startup cost were mixed among participants as opportunities or challenges. Further research needs to be conducted to determine where the Missouri meat goat industry is headed.

KEYWORDS: goats, focus groups, Missouri, production, producers, survey

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Approved:

Elizabeth Walker, Ph.D., Thesis Committee Chair

Benjamin Onyango, Ph.D., Committee Member

Melissa Remley, Ph.D., Committee Member

Christine Sudbrock, M.S., Committee Member

Julie Masterson, Ph.D., Dean of the Graduate College

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I dedicate this thesis to my grandparents: Doyle and Lea Riley

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INTRODUCTION

The meat goat industry is quickly expanding and is one of the fastest growing segments of livestock production in the United States (USDA APHIS, 2012), both in inventory and markets for products produced from goats (USDA APHIS, 2004). Most goats in the United States are produced in the South (Texas), Southeast (Tennessee, Georgia, Kentucky, North Caroline, Florida and Alabama), Midwest (Oklahoma and Missouri) and West (California) (Solaiman, 2007). As of December of 2010, there were 152,000 goat operations in the United States, with 128,000 estimated to produce meat and other goats, and the other goats made up 82% of all the goats produced in the United States (USDA NASS, 2011). By 2018, there were 2.62 million head of goats in the United States. Meat and other goats totaled 2.1 million head (USDA NASS, 2018). Increases in immigrant Hispanic, Middle Eastern, Southeast Asian and Caribbean populations in the United States have increased the demand for goat meat due to cultural familiarity (USDA APHIS, 2004; USDA APHIS, 2012). Continued growth in the goat industry will be needed to meet domestic demand, as long as ethnic populations continue to expand in the United States (USDA APHIS, 2004; USDA NASS, 2011).

All goats can be harvested for meat; however, some are better suited for meat production. A majority (59.8%) of goat operations with 10 or more goats raise Boers, 38% raise crossbred goats, 10.3% raise Spanish type, and less than 10% have goats of other breeds.

Many meat goat producers are new to the goat industry with 35% raising goats for 5 years or less (USDA APHIS, 2012). Providing producers with knowledge and opportunities to strengthen or expand their meat goat marketing could aid in opportunities for producers. Identifying solutions to the challenges of marketing and processing of goats and subsequent meat

for consumption is needed (Madden, 2010). Moreover, understanding the challenges with consideration for: rising demand for goat meat, startup costs, labor, brush control and multi-species grazing, prolific nature of goats, control of internal parasites, marketing goat meat, limited expertise and information and limited access to financial support is needed to provide further opportunities for producers (Okepbholo & Kahan, 2007).

Rationale for the Study

The first comprehensive study conducted on the United States goat industry was by the USDA's National Animal Health Monitoring System in 2009 (USDA NASS, 2009). The current study further develops on what was determined by the USDA NASS (2009), by determining the opportunities and challenges faced by rural meat goat producers in Missouri. Identifying the factors that contribute to success or failure of a producer's goat operation and marketing across the state of Missouri, will aid in recommendations for solutions to the issues determined by producers in the state of Missouri.

Purpose of the Study

The purpose of the current study was to conduct research and collect data pertaining to goat production and marketing throughout Missouri. The industry faces issues regarding marketing and processing of meat, as well as education of producers. The current study is part of a larger research study to consider challenges and opportunities within the meat goat industry. The first stage of the research is presented here. Our goal was to determine what Missouri meat goat producers consider to be challenges and opportunities within the goat industry in Missouri. The information collected during the study was subsequently used to aid in the development of a

larger survey for goat producers to obtain additional information on the goat industry. In addition, material collected will be used to produce educational materials to enhance the meat goat industry in Missouri.

Research Objectives

The research objectives are as follows:

1. Determine current perceptions of meat goat producers in Missouri regarding the industry.
2. Determine what Missouri meat goat producers perceive as opportunities when producing meat goats in the state.
3. Determine what Missouri meat goat producers perceive as challengeswhen producing meat goats in the state.

Significance of the Study

The potential value of the current study could enhance the rural economy in limited resource areas. Identifying the opportunities and challenges faced by the industry could help aid in resource areas. Identifying the opportunities and challenges faced by the industry could help in expanding the meat goat industry in the state of Missouri. The current study is phase one of a multi-phase project that will include quantitative and qualitative research with meat goat producers, processors and consumers with the intent to improve the state of the industry in Missouri, Georgia and Arkansas. Educational materials will be developed based on the results from this study. Further a quantitative survey was developed guided by the focus group findings and administered to producers in Missouri, Arkansas and Georgia, with the intent of improving

opportunities for meat goat producers. Interviews have been conducted with processors across the state of Missouri and will be conducted in the future in Arkansas and Georgia. Consumer interviews will also be conducted across Missouri, Arkansas and Georgia. If the market for meat goats in these states is to increase, it will be necessary to address potential challenges and exploit opportunities in the supply chain to ensure supply will be available to meet the demand for goat meat.

LITERATURE REVIEW

World Production of Meat Goats

The world total number of goats in 2008 was 861.9 million head. Goat populations are of considerable importance to Africa, Central America and Asia. Goat meat is widely consumed in some developing countries. Developing countries accounted for 97% of goat meat produced. The total amount of goat meat produced worldwide in 2008 was 4.9 million metric tons (Aziz, 2010).

World Consumption of Meat Goats

Understanding goat populations and their productivity will help to determine the outlook of the goat industry, both internationally and in the United States. Increased meat goat production in the United States is due in part to increasing ethnic diversity (USDA APHIS, 2004). Three major groups are important for goat meat markets in the United States: Muslims, Hispanics, and those of African ancestry (Nelson et al., 2004). Among these immigrating groups, there are different types of goats preferred. Hispanics prefer younger milk-fed goats with light colored fat, while Muslims prefer a heavier goat, but will consume bucks or does of all sizes and ages. Muslim consumers demand that goats be slaughtered under a type of religious slaughter known as Halal and will buy live goats for home or religious slaughter (USDA APHIS, 2004). African ancestry and Caribbean ancestry prefer mature goats, heavily spiced and cooked for a long period of time (Gillespie et al., 2016; USDA APHIS, 2004).

History of Goats in the United States

Over the last 20 years, meat goat production has been the fastest growing livestock enterprise in the United States (Gillespie et al., 2016). In the United States, goats are used to provide meat, milk and fiber but are also used as show animals, as 4-H and FFA projects, industrial (including weed control and hiking/packing), and biotech. The largest goat industry consists of goats used to produce meat (USDA APHIS, 2004). Growth of the meat goat industry has increased because of a rise and change in ethnic populations who consume goat meat in the United States (Gillespie, 2016; USDA APHIS, 2004).

United States Production of Meat Goats

In 2010, there were roughly 152,000 goat operations in the United States with an average herd size of twenty head of goats (Aziz, 2010; USDA, 2011). Small scale (10 to 19 goats) goat operations account for 82.6% of all U.S. goats (NASS, 2007). Most U.S. goat operations with 10 or more goats, raised goats for meat, with lower percentages raising goats for milk or fiber (USDA, Goat 2009). Almost all small (10 to 19 goats) goat operations keep their goats on fenced range (uncultivated fenced pasture) or fenced farm (cultivated fenced pasture). Of all meat goat operations, 65.1% feed pasture grassed all of the time and 83.2% of meat goat operations feed weed and browse at least some of the time (USDA APHIS, 2012).

Dairy. Milk goats and kids went from 373,000 in 2017 to 380,000 head in 2018. Of those, milk breeding goats totaled 334,000 in 2017 and rose to 340,000 in 2018, while milk market goats and kids totaled 39,000 in 2017 and 40,000 in 2018 (USDA, 2018). This indicates that milk goat production is increasing in the United States. There are several types of milk goats found in the United States including: Alpine, LaMancha, Nubian and Nigerian Dwarf to name a

few. These goats produce different value-added products including milk and cheese, to market to consumers.

Meat. Meat and other goats and kids totaled 2,115,000 head in 2017 and went down to 2,098,000 head in 2018. Of those, meat and other breeding goats totaled 1,706,000 head in 2017 and dropped to 1,698,000 head in 2018. Meat and other market goats and kids totaled 409,000 head in 2017 and 400,000 head in 2018 (USDA, 2018). These types of goats are typically used for show stock or meat consumption.

Fiber. Angora goats and kids went from 152,000 head in 2017 to 142,000 head in 2018. Of those, Angora breeding goats were 131,000 head in 2017 to 123,000 head in 2018 and Angora market goats and kids totaled 21,000 head in 2017 and 19,000 head in 2018 (USDA, 2018). In the United States there were 133,000 goats clipped for Mohair in 2017, averaging 5.5 pounds per clip. In total 32,8854.468 kg were produced in 2017. The price per pound in 2017 was $5.00. There are several kinds of fiber goats found in the U.S.; for example, Angora and Cashmere. Fiber goats produce fiber that can be made into other products like clothing and other textiles.

Why Meat Goats are Produced in the United States

Producers own operations for a multitude of reasons including profitability, maintaining land, wanting to live in a rural area, taking over the family farm, etc. According to Dunn et al. (2015) the five top reasons for producing goats are:

1. “I enjoy working with goats,”
2. “Goat production fits well into my land management plan,”
3. “I can raise goats on a relatively small acreage,”

4. “Goat grazing preferences are different from other species,”
5. “My family can be involved in the goat enterprise.”

The least popular three reasons for selecting a goat enterprise according to Dunn et al. (2015) were, “Goat production is profitable”, “Low cost to purchase and raise goats”, and “A high level of skill is not mandatory for producing goats.” However, according to USDA APHIS (2012) income was rated as a very important reason for raising goats, 22.3% for operations with 10 or more goats. As operation size increases, income becomes more important. Brush control was also related as a very important reason for raising goats for one-third of all meat goat operations (10 or more goats) at 36.1% (USDA APHIS, 2012). Goats are desirable for producers who have limited acreage and want to raise livestock. Goats can be easier to manage and less costly to raise when compared to many other livestock species (USDA NASS, 2011). Farmers with small acreages (5 to 10 acres as defined by the USDA) are looking for enterprises that aid in land maintenance and goats can be used for brush control and increase producer utility in ways beyond production of meat and income (Gillespie et al., 2016).

According to Ibrahim et al., (2017), raising meat goats is an affordable enterprise for livestock producers, because the meat goat industry has an underdeveloped market structure and infrastructure compared to more well-established cattle, poultry and swine. While meat goat production has been increasing, the lack of infrastructure comes from a lack of commodity-based organizations, university sponsored education and research or well-known marketing channels (Fisher et al., 2004).

Financial Advantages of Raising Meat Goats

Currently, there does not appear to be any financial advantages to raising one type of goat over another as variable and fixed expenses for goat farms (per acre) are not statistically different (Quishim et al., 2016). In addition, in the southeastern United States, profitability did not differ statistically from small (<8.0937 hectares) to large (≥8.0937 hectacres) farms. When comparing southeastern United States meat goat profitably, by production segment, meat goat farms had lower costs than breed and show goats, and mixed farms. Meat goat production profitability is directly impacted by the selection of highly productive breeding stock and increasing herd size directly impact profitability (Qushim et al., 2016).

As operation size increases, income becomes more important to producers with 54.3% of large (100 or more goats) rating income as very important when raising goats (USDA APHIS, 2012). When compared to other livestock species, meat goats are less labor intensive and easier for women and children to handle because of a reduction in injury from the smaller animal (Okepbholo et al., 2007). Goat production can also accompany other livestock production, like cattle, on lower quality forage (Qushim et al., 2016).

Demand for Meat Goats

The expansion of meat goat production in the United States has not satisfied the demand for goat meat in the United States, and demand for goat meat outpaces supply in the United States (Coffey, 2006; Gillespie et al., 2016). Demand for goat meat in the United States also exceeds the supply of Australia and New Zealand, the two largest exporters of goat meat go the United States (USDA APHIS, 2004). The current and expected increase in demand for goat meat, along with the lack of supply to meet the demand, have created opportunities for producers

to fill a void while also enhancing their established operations by adding meat goat production (Luginbuhl, 2000). However, current meat goat prices are erratic and unorganized; producer marketing is limited because of difficulty and expense in getting animals to facilities, as well as convincing mainstream consumer to consume goat meat (Okepbholo et al., 2007). Producers seeking direct sales of their meat goats can tailor their breeding programs to correspond with major religious holidays for the ethnic groups discussed in the next section. However, some producers may not be as reactive to local ethnic demand and may find it easier to sell to sell their meat goats through auction markets (USDA APHIS, 2004).

United States Consumption of Meat Goats

As the United States ethnic population increases, so could the domestic consumption of goat meat in the United States. Preference for goat meat in the United States is rapidly increasing (Simon, 2013). Additionally, demand from health-conscious consumers could increase demand. In addition, an increasing familiarity with goat meat in the United States could expand the market for goat meat products. There is also potential to increase demand for fresh products packaged in individual and family size portions as well as pre-packaged and processed products (Simon, 2013). Traditional Americans, and those who have not recently immigrated, are becoming more familiar with goat meat and the health aspects through the expansion of ethnic cuisine which has increased demand from this population (Simon, 2013).

In 2010, approximately, 13% of the United States population was foreign born with 53% of those residents originating from Latin American and the Caribbean, followed by 28% from Asia (Greico, Acosta, de la Cruz, Gambine, Gryn, Larsen, Trevelyan & Waters, 2012). In 2010, 50.5 million people identified as Hispanic in the United States, totaling 16% of the total

population. From 2000 to 2010 the Hispanic population in the United States increased by 43%. The Black or African American population represented 13% of the population or 38.9 million. The Asian population totaled 14.7 million, or about 5% of the population in the United States which was a 43% increase from 2000 to 2010 (Humes et al., 2010). Immigration from these countries increases demand as goat meat is regularly consumed in these regions. Further, their descendants may continue to consumer goat meat. Growth of ethnic populations in the United States and a desire for a healthy diet drove demand for imports of goat meat by 12% (in the first four months of 2016 compared to the same period in 2015; Ibrahim, Pattanaik, Onyango & Liu, 2017).

Current Marketing of Meat Goats

The easiest way to find a buyer for meat goats is at an auction or sale barn, but marketing straight to the consumer has the potential to increase profit for the producer because there are no transportation costs, middlemen, or sales commissions (USDA APHIS, 2012). Large grocery stores are skeptical of selling goat meat because of the supply may not be reliable or consistent, cuts may not be uniform, there are not a wide range of meat goat products available (Okepbholo et al., 2007). Demand from consumers is typically not for induvial cuts but rather whole carcasses, quarters or sixths of a carcass. Larger bone in cuts are more conducive to traditional cooking methods (roasting and stewing) and demand for steaks, roasts and loins have not risen in the store (USDA APHIS, 2004).

How Religion Affects Consumption

The United States has experienced a growth in religious groups who prefer goat meat, particularly those of Muslim or Islam faith (Simon, 2013). Religion has a strong influence on peoples' beliefs, personal identify and value systems (Mokilis et al., 2010). Religious traditions could directly influence varying aspects regarding the followers' choice behavior because of the rules and taboos that may be associated with it. For example, the importance of fasting, feasting and food purchase patterns may be directly influenced by religious traditions. The highest consumption time for the Hispanic population in the U.S. is around Christmas, New Years and Easter (Simon, 2013). Continued development of goat markets may rely on availability of religious slaughter like Halal since many ethnic groups demanding goat meat are Muslim (USDA APHIS, 2004). Muslim and Islamic consumers should provide significant demand for goat meat particularly around major cities and metropolitan areas (Simon, 2013).

How Education Affects Production

The meat goat industry is still fairly new as compared to more established industries like beef cattle and swine (Qushim et al., 2014). As compared to the more established and traditional livestock enterprises, there is comparatively limited information available about U.S. meat goat production (Qushim et al., 2014). Only 10.7% of meat goat producers have raised goats for 21 or more years (USDA APHIS, 2012).

According to a poll taken in Iowa of participants in the 2011 survey said they visited their USDA service center an average of size times in the previous two years with only 25% visiting one to three times total and 14% not visiting at all. The last decade has been an increase in agricultural websites that include: farm magazines, agribusinesses, farm groups and other

entities. Of farmers surveyed by the Iowa's Farm Poll, 84% said they use the internet to get information on weather, 78% said they use the internet to retrieve information on markets and 75% use the internet for agricultural news. Production information was only accessed by 39% of farmers participants in the survey (Iowa State University Extension and Outreach, 2011).

More recently, Cole and coworkers (2014) found meat goat producers in Missouri use a variety of ways to acquire information, but most often use the internet or other producers with less than half of survey participants using land grant university cooperative extension (Cole et al., 2014). In a national survey (USDA APHIS, 2010) the three most important sources of information included other producers, veterinarians, nutritionists and other paid consultants and the internet.

Focus Groups

Qualitative analysis can be conducted in many ways and focus group analysis has subtle differences when compared to other forms of qualitative data (Krueger & Casey, 2015). Focus groups are a special type of groups of people regarding purpose, size, composition and procedures that are followed. Focus groups are used for decision making by using the findings from the focus groups to gain understanding on the topic to make more informed decisions (Krueger & Casey, 2015). Focus groups are carefully planned discussions designed to obtain perceptions from participants on a defined topic in a permissive and nonthreatening environment (Krueger & Casey, 2015). One requirement of a focus group is that individuals have open dialogue directed by a moderator who will ask questions pertaining to research questions. Focus group discussions are conducted several times with similar participants each time so the researchers can determine any trends or patterns in the participants'' perceptions (Krueger &

Casey, 2015). The question protocol used for focus groups, given by the moderator, are first used in a pilot study with a representative group of participants to determine if the questions make sense to the participants and to get an idea of the type of answers the questions may elicit. After the pilot study, questions are rejected or edited to be more well received by participants.

Focus groups can range in size from five to eight participants, having as few as four or as many as twelve. The group must be small enough to allow all participants to share insights but large enough to provide a density of perceptions. At least three focus groups are needed to compare data collected across the groups. Open ended questions in a focus group are carefully predetermined, sequenced and phrased to be logical and to allow the participant to understand what is being asked (Krueger & Casey, 2015).

Next, the researcher needs to identify key questions and think about analysis for those key questions. Pilot testing of the key questions aids in anticipating what will be said in the actual focus groups. Debriefing of researchers after the focus groups and organizing the data immediately after the focus groups is essential before transcribing. When not using transcriptions, the analytic process is based on memory, field notes, and debriefings from previous steps. Transcription based analysis is useful when the risk of being wrong is high but requires more resources than other methods (Krueger & Casey, 2015). Coding is then done by several researchers working together to categorize data based on the information provided by participants. Once coding is completed, the report of the results begins.

Summary

With demand form ethnic groups and potential for increased demand from mainstream consumers, the demand for goat meat will continue to increase. However, challenges continue to

pose problems for the industry, including marketing goat-derived products and limited expertise and information. Using focus groups could provide further insight into the state of the meat goat industry in Missouri including opportunities and challenges.

MATERIALS AND METHODS

All procedures were approved by the Protection of Human Subjects Institutional Review Board at Missouri State University on October 9th, 2016, see Appendix B.

Research Design

The purpose of qualitative research is to understand people's perceptions of their own experiences (Merriam & Tisdell, 2016). In qualitative research, the researcher is the primary instrument of both data collection and analysis. The goal of qualitative research is to understand the subject matter from the perception of the participants rather than the researcher by exploring themes, patterns and opinions of the research participants (Merriam & Tisdell, 2016). Further, qualitative research is inductive, meaning the data collected is used to draw conclusions regarding the topic under investigation (Merriam & Tisdell, 2016). This is particularly useful when little is known on the topic. Quantitative research, on the other hand, aims to collect data to examine a predetermined hypothesis. Quantitative research relies on numerical data to test statistical significance to allow the researcher to make generalizations regarding the results (Creswell, 2014). There has been little research done to date on the state of the Missouri meat goat industry which lead to the selection of qualitative research methods further explore the topic with producers. Results will also be used to inform a future quantitative study.

This study utilized a basic qualitative research design using focus groups to gather information from participants. By capturing participants thoughts and opinions in their own words, the study aims to use rich description rather than numbers to describe the Missouri meat goat industry. Focus groups can be particularly useful for qualitative studies when participants

feel more at ease allowing them to discuss their production practices. This could have led to more open answers, and more honest responses so the researchers could gain a better understanding of the opportunities and challenges producers face in Missouri.

Methodology

Researchers from Missouri State University and Lincoln University assisted with recruitment of focus group participants and logistics for each of the three locations. A pilot focus group was conducted to test focus group questions and give the researchers a baseline plan of action to conduct the further groups. Based upon this pilot, questions were refined for clarity. The target population for this study was current meat goat producers. Participants were required to live and raise meat goats in Missouri and were selected from goat producer registries, association websites, word of mouth, and extension mailing lists. Individuals were chosen based upon their proximity to the focus group locations and if they were currently raising meat goats. Three focus groups were conducted with 25 total meat goat producers.

Twelve participants volunteered for our focus group while attending the Missouri Livestock Symposium in Kirksville, MO in November of 2016. Volunteers were vetted to ensure they met the research parameters. The next nine participants were in Jefferson City, Missouri in December of 2016. The last focus group consisted of four participants in Springfield, Missouri in January of 2017. Each focus group was conducted by a moderator and aided by multiple researchers who took notes. Observations of the focus group were recorded by the researchers while the moderator facilitated discussion amongst participants. Handwritten notes were reviewed to document emerging themes and aid in understanding themes and patterns. Data was

then compiled, and transcripts created. Pre-existing codes were used from a chosen framework and used to code each transcript. Once coding of the transcripts was completed, analysis began.

Data Analysis

The purpose of the study being conducted drives the analysis process of focus group-based research. Focus group analysis is systematic, verifiable, sequential, and consequential. The analysis process is deliberate and planned. Another researcher could arrive at similar findings with the same data. It is an ever-evolving process of enlightenment and analysis was started after the first focus group. (Krueger & Casey, 2015).

A priori coding was used to analyze the data collected from the three focus group transcripts. Coding was based off a previously created framework developed by Okepbholo and Kahan (2007). QSR International's NVivo 12 qualitative data analysis software was used to create categories for each of the following codes: opportunities, rising demand for goat meat, low start-up cost, less labor intensive, brush control and multi-species grazing, prolific nature of goats, challenges, the control of internal parasites, marketing goat meat, limited expertise and information, and limited access to financial support. Each category was then split into nodes for and against in each of the categories. Two researchers coded each category and then compared codes based on each researchers' findings, along with each focus group location. Reliability and validity were examined and any issues were corrected prior to data analysis. NVivo software was used to create a percentage of agreement or disagreement for each node called a Kappa coefficient, the results of which are located in "Appendix A". Based on the Kappa coefficients, moderate levels of agreement were found between the two researchers. This may be partially

explained by differences in the individual researchers' experience coding, the amount of context coded, and small differences in personal interpretations of the code.

Limitations

A limitation of this study comes from the application of the a priori coding. One of the indicated codes was a lack of financial support, however, the research protocol did not include questions regarding financial support. As such, the study was not able to determine if lack of financial support is perceived as a challenge by Missouri meat goat producers.

Another possible limitation might have been uneven sample sizes amongst our focus groups. In the Kirksville focus group there were 12 individuals participating and a strict schedule of 90 minutes to complete the research protocol. It is unclear if the large group and strict time frame may have prevented some members from fully sharing their thoughts. Another limitation is that two researchers involved in the project are very well known in the Missouri meat goat industry. Their presence may have biased the answers provided by participants in ways which cannot be known. An additional limitation with qualitative work is the inability to provide generalizations regarding the findings. Instead the goal of this project to describe the setting with enough detail that future researchers are able to determine transferability, where the researcher can decide if the settings under which this study was conducted are similar enough to their own that the results might apply (Merriam & Tisdell, 2016).

RESULTS AND DISCUSSION

Data analysis produced themes congruent with the framework selected. The findings were organized using the framework as a guide. Meat goat production practices, challenges and opportunities, are explored. Participants' voices are used to further capture their experiences and perceptions.

Opportunities

Okepbholo and Kahan (2007) identified five potential opportunities for meat goat producers including rising demand for goat meat, low startup cost, less labor intensive, brush control and multispecies grazing, and the prolific nature of goats. The analysis of the focus groups found participants thought brush control and multispecies grazing was a definite opportunity, as well as rising demand for goat meat. Evidence from the focus groups for low startup cost, less labor intensive and prolific nature are mixed on whether they are opportunities or challenges, depending on participant perceptions.

Rising Demand for Goat Meat. Evidence suggesting rising demand for goat meat as an opportunity for producers in Missouri was found in all three focus groups. Participants in Jefferson City expressed there was demand in bigger cities, while Kirksville expressed demand for goat meat in general and Springfield expressed that while there was demand, no one was marketing for processed goat. Ethnic demand was also identified as increasing the demand for goat meat in the Kirksville and Springfield focus groups. Jefferson City participants agreed with each other that eye appeal and market information as well as raising show animals versus

production animals were an opportunity. Increasing ethnic demand was often cited as an opportunity for meat goat producers in Kirksville and Springfield.

Tapping into demand from ethnic consumers may not always be straightforward. One participant suggested there is ethnic demand, but producers need to learn how to meet that demand. In a Kirksville participant's own words, "*So, the ethnic demand is there it's just a matter of us learning how to meet that demand."*

Jefferson City participants said choosing when to sell based on the markets (spring and early summer, January/February) and a lack of information on marketing makes timing difficult. Springfield participants also struggled with show versus production animals. Some were uncomfortable with selling their show animals to be used for meat or other production practices. The participants voiced they had not raised their show animals to be used for anything else. In Kirksville, participants thought "promotion" or lack of "promotion" of goat meat should follow the supply and demand within the industry.

Kirksville was the only focus group that indicated the perceived demand for goat meat was not necessarily increasing. Some participants said consumers "cannot stand goat meat" and some ethnicities "will not consume it". In their own words:

Kirksville participant 2: *"My wife and sister-in-law absolutely detest and can't stand goat."*

Kirksville participant 3: *"The Germans where I come from, I mean most of them wouldn't dare eat goat. Never heard, never 'You eat goat?"*

A lack of ethnic populations in more rural areas also contributes to a lack of demand according to participants in this group. Producers indicated they do not know how to move the

product. Further, the participants in Kirksville see the industry as stagnant and leveling off in terms of production.

Kirksville participant 4: *"Well statistics tell us that the goat industry is, is going stagnant or down. I, I tend to think I feel that way. I agree with those numbers."*

Kirksville participant 5: *"I think geographical, but if you look at it on a national level, the statistics, it's kind of leveled off from where it was. You know? It's kind of come down and leveled off. And, at least I thought maybe...from our perspective of looking at it, from an academic standpoint, a lot of it had to do with um, the price of feed and grain after the drought of 2012. I've noticed that it's kind of came down and leveled out."*

Low Startup Cost. Some focus group participants suggested they have no input costs based on their management practices and the small amount of space goats take up. *"We have no input costs. Two years ago, I had $6 of hay in them, this last winter I have $0. I mean maybe like 6 oz. of feed on the two days we got them up."*

They also suggested feeding goats grain mixtures is also efficient because they do not need as much as other livestock. Participants in the focus groups suggested that "feeding out animals", price issues and spending money on registered stock create higher startup costs for some, suggesting startup costs are higher than expressed by previous research. The focus group participants suggested there is added expense when starting out raising goats. According to participants, those who get into raising meat goats, specifically those that breed registered stock, spend extra money and do not stay in the industry for an extended period. It was discussed that issues with fencing, adding more or having the money for more, would be considered a challenge, as well as land prices and a lack of land.

Less Labor Intensive. Labor is an issue that varied by focus group location. Some

participants suggested they do next to nothing for their goats when possible. They let genetics and "mother nature take its course" by culling unwanted genetics in their herds. Culling by the producer is still required, and usually takes place if maintenance like hoof trimming or parasite control is needed according to participants. If the goats in the herd cannot be almost self-sufficient, some participants are taking them out of the herd completely.

> Jefferson City participant 1: *"Okay, I was just going to say maybe the bigger challenges I see right now is genetics. So, I've taken a little bit different route of most people here...and maybe you call it brutal but we do nothing for our goats except intensive grazing. They kid in May and we're not going to help them I mean if there's an abandoned kid I'm going to pick it up and take it to the house you know but it's not going back in the breeding herd…"*
>
> Jefferson City participant 2: *"I can't trim a hoof, or they'll go, and that's taken a while to get there, but finding a pool of goats to bring in under that regimen has been difficult because we want the profit margins are great…Since we're sorting them once a year in August we'll pull off the males check females for something, see if they have problems, and that's taken us awhile to get there, and it was brutal when we started because there was a lot of fall out."*

Brush Control and Multispecies Grazing. During the focus groups, brush control and multispecies grazing were major topics brought up by participants. Many are using goats to eat what their cattle will not. They have found raising cattle and goats together works well for their operations. Raising the two species together has aided in their parasite control and has increased profitability of both species on their operations, according to the participants. Some participants have found raising goats is not only beneficial for cattle but also sheep and horses, and state the

goats use unusable land from brush overgrowth and create variety in their operations. In their own words:

Springfield participant 1: *"... I don't know if you guys have heard about the whole, goats keep ringworm off cows, but I mean that obviously really helps, um especially cause they're show cows…"*

Jefferson City participant 1: *"We brought in horses after our goats and we found that combination extra good cause those horses really take the parasites off of pasture, they do an awesome job so we, our winter pasture have all the horses run. They spend summer in there and that's been a really awesome combination for us."*

Jefferson City participant 2: *"...graze it twice with the cows then it'll be better for the sheep anyway as far as parasite go. um I kinda use in off times of the year some years sometimes of the year will use the cows as a tool to make the pasture ready for the sheep and goats and other times of the year the sheep and goats are a tool for the cows… "*

Prolific Nature of Goats. Jefferson City and Kirksville focus groups expressed that goats are prolific in nature. Goats birthing multiples seem to be a large challenge for those who own goats not an opportunity as suggested by previous research. In Jefferson City, it was expressed that triplets are a "pain" as the mothers do not claim all kids and then the producer is unsure of whose kid belongs to each mother goat. Jefferson City participants shared that kidding season is a "pain" as well. Jefferson City participant 1: *"...think kidding season is more the pain with goats than it is with cattle.".*

Jefferson City participant 2: *"...and I think it has and I don't know for sure on everybody, but I would have eight to ten sets of quads every year sort of thing so one mama worryin' about 4*

babies vs. one mama worrying about one baby. You know. I mean you do get twins in cows but not like you get ... yea sort of thing you know so I mean that's another issue you know…"

Jefferson City participant 3: *"...even triplets can be a pain…"*

Jefferson City participant 4: *"...so they have their first one in this corner of the barn and they move 8 ft. and they have their second and lick that one a little and move 8 ft. and have their 3rd and they forget about that first one that's over there chillin' and in the meantime, another one kids and then who does that one go to? "*

Kirksville had different concerns with the prolific nature of goats. Instead one participant expressed their conception rates are low and the death rates are high, as well as concerns about pulling kids during birthing.

Kirksville participant 1: *"My conception rate is not high enough, based on what people like participant x and other research people, institutions have said. And I know that, from the checkbook. The kid death rate is too high, whatever --- what I don't know what the number is supposed to be, should be zero. I would like for it to be zero. I know that's not realistic. The kid death rate is too high."*

Challenges

Okepbholo and Kahan (2007) identified five potential challenges including control of internal parasites, marketing goat meat, limited expertise and information, and limited access to financial support for meat goat producers. Participants voiced they felt control of internal parasites, marketing goat meat, limited expertise and information were definite challenges when producing meat goats. Limited access to financial support cannot be determined as it was not brought up in the discussions during the focus groups.

The Control of Internal Parasites. In the participants own words, *"Definitely internal parasites are probably THE biggest hurdle especially spring and the fall when it's the wettest. Um, and then any kidding issues with preg-tox and ketosis and, and polio and others. Like, like she said if it's going to hit, it's going to hit a goat a lot quicker than it will anything else it seems."*

Focus group participants suggested parasite issues arise in certain breeds of goats (particularly Boers) more often. Kirksville participant 1: *"We got into goats in 1974. Just goats and in 2000 we went in with the Boer goats. Problems we had with Boer goats was they didn't handle pests you know, parasites, as well."*

Jefferson City participant 1: *"That maybe why, that was our experience we had more problem with the Boers with parasites and …and we've done a lot of culling but anytime anybody has a problem they have a brown head and white body in the sick pen."*

Participants also suggested selling "wormy" goats is a good practice in prevention of parasites. Jefferson City participant 2: *"Um I can't worm them more than once a year, I can't trim a hoof, or they'll go…"* Kirksville participant 2: *"…they're going to live or die. So, uh and the culling factor, the way to do that if you got one that's wormy all the time, get rid of it."*

Focus group participants suggest that once a goat has parasite, they never fully recover from them. Jefferson City participant 4: *"Cause that sick animal once it gets stick with parasites it never gets over it…"*

Kirksville participant 1: *"Of course, everybody has parasites, no matter if you're raising Kikos or Boers you got some parasites, and that does take a toll."* Culling is also a major practice with goats in parasite prevention among the Springfield participants. Animals that do not meet the

characteristics of a healthy animal are culled to create a healthier herd, as stated by some participants.

With Jefferson City participants, it was suggested that producers learn the habits of their goats to decrease the number of goats infected with parasites. Maturation of the industry and drug regulation are also issues they see as contributing to parasite problems in their goat herds. Jefferson City participant 5: *"...feel the industry is, especially the goats is in a state of maturation. You know what I think it was kind of a really everyone had a few and get this it's kind of like uh everyone kind of hinted at everyone's talking about Boers were this thing forsure, and you're working on solving some of the problems of Boers, terrible feet and parasite issues and I feel like that's kind of where the industry is moving and the people that have stuck with it and saw that this can work but this takes much labor how are we going to do this?"*
Jefferson City participant 6: *"...for sheep and goats there's not as many pounds labeled for our animals with the new drug regulations it's going to be the saving grace of the industry really because it's going to be culling, you're going to have to cull and you're going to have to select..."*

Participants in Kirksville and Jefferson City reported that the health of the goat is related to the environment they are in and most of the producers interviewed limit their deworming regime because of a trend in the industry to heavily deworm the animals. Kirksville participant 2: *"We have very few worm problems now, and uh the way we've done that we've started rotating pastures, you know loose mineral which keeps them healthier. A healthy goat won't have a lot of worm problems. You know they'll have worms but they just don't --- it's not detrimental to their health."*

Jefferson City participant 3: *"Well and I think there was a time when people wormed like every month whether they needed of not this crazy stuff that, I mean that in the industry was such a nightmare, so they were creating monsters before they ever…"*

Kirksville participants also suggested that rotating pastures and access to mineral seem to aid their herds in parasite control. Kirksville participant 4: *"But the worms, uh if you rotate your pastures uh give 'em loose mineral I don't know what that has to do with it, but it seems like after I started feeding them a loose mineral, my worm problems started decreasing."*

Kirksville participant 2: *"Uh you know loose mineral which keeps them healthier. A healthy goat won't have a lot of worm problems. You know they'll have worms, but they just don't --- it's not detrimental to their health."*

Marketing Goat Meat. Marketing goat meat provides both potential and limitations for goat producers in Missouri. Jefferson City participants suggested niche markets and ethnic holidays are times to sell, but because of a lack of processing facilities who will or can process goats and a lack of inspection at those facilities, they cannot meet the demand. Jefferson City participant 1: *"…if it's going to move in, into a market like to more of a retailer and that way of processing has to be addressed. And I don't know what that is but it's interesting on the goats, this last year we've done marketing and we were very disappointed in the sale barn results and the spottiness of price. And this year we intend to market that way we will either go to a killing floor and know what the poundage is and bite that bullet or ethnic markets and well see how that goes."*

Jefferson City participant 2: *"…my market place was uh with ethnic groups you know was kind of what's the right word for it? I can't think of it right now but anyway, they were my niche market and uh typically holidays and for just during thru course of the year…"*

The processors are not meeting the producers' or their perception of consumer expectations on how the animal should be processed, according to focus group participants. Jefferson City participant 3: *"...there's like you have to have an inspector there so many days because this is for retail. This is not for home. So, there's a big issue on all that so at many times they couldn't keep inspectors coming so you know and when I needed it like next week..."* Jefferson City participant 4: *"...and it was a little difficult at times because you know when local processor would say I don't have an inspector coming for two months."*

All three sets of focus group participants stated most of the time if they were to sell animals, it is a live animal, on the hoof. Those in Kirksville see an up and down need at the processor in their words, which makes it difficult to process their goats if they wanted to. Kirksville participants felt that processors "don't need your business." Kirksville participant 1: *"...we've sold quite a few to a local processor that you'd mentioned...about 40 minutes from us. That's been pretty up and down whether or not they need them. We feel like that's could --- could've been something good."*

Kirksville participant 2: *"...we're blessed with a bunch of processors in Missouri. Way better blessed than most states. But a bunch of them are fairly independent and they don't act like they need your business sometimes."* Kirksville participant 3: *"Marketing has been my big problem, as far as way up and way down and you have to really be, I guess, luck is not a good word, forcing it is a better word, to hit the market at just exactly at the right time. And it's hard to breed for the market, because it's usually out of season breeding and that's, you're not always successful at that."* Most are not processing their goats unless it is for personal consumption. Kirksville participant 4: *"...pretty universally, you, when you're marketing your goats, you're*

marketing them on the hoof as, as live animals um, and then processing some for your own consumption."

Other reasons for not processing goat meat are that producers are selling goats to order buyers, selling show stock at sale barns and sending some straight to market. Springfield participant 1: *"I think the problem with this area is if you can find an inspector, a place to have it done. And then trying to get into like, like your coop or whatever, and market, you've got to find those types of things to market. And it's hard and I think the biggest problem here is most people here have 20 to 30 head. You can't fill a constant supply…that's the biggest problem in this area. Where you go to Texas and you go out San Angelo area and you round up several thousand kids."*

The ethnic groups are looking for older animals and some are holding animals until January or February to meet that demand according to Jefferson City participants. The cost of processing is also an issue and why some are selling animals "on the hoof" according to focus group participants, instead of already processed. Some in Kirksville even said to "focus on what they know and leave the rest to someone else" meaning if they did not start out taking their goats to processing, they would not start now. Kirksville participant 5: ***"****That's something, we want to focus on the things that we think we can halfway do right, and I want to leave that business to somebody else."*

Limited Expertise and Information. The lack of information for meat goat production and practices came up in the Springfield, Jefferson City and Kirksville focus groups. Focus group participants had input on this subject in many different areas. Participants stated markets are not providing results from sales, due to a lack of staff for the market reports and a lack of numbers at the sale barns. Some participants stated that livestock markets are "bumping"

numbers for untrue markets when they *are* reporting and there is a lack of numbers coming from the sale barns.

When it comes to finding information there were many topics of concern including: Veterinarians' lack knowledge about goats, the "movers and shakers" leaving the industry making learning from other producers difficult, and the internet being an unreliable source of information. Jefferson City participant 1: *"...and movers and shakers a lot of them have left the industry I really kinda feel that was cause even like event if the goat magazines and stuff like that there used to be some spectacular articles you know you would read word for word all the way through and stuff like that and I mean I don't get all of them anymore like I used to but it just seems like it died down like there wasn't a lot of fire in some of them."*

Focus group participants in Springfield and Jefferson City also suggested that because the goat industry is behind other livestock industries there is a lack of knowledge and information about genetics, carcass information, reproduction, and production practices. Jefferson City participant 2: *"Always take from the cattle people and adapt it do goats...like what they did with the angus the small birth weights the easy care all that stuff that's where I got a lot of stuff and some of the rotation grazing all that stuff the cattle people they have a lot of money to do that we don't so they're on top of all of that stuff and no we're going into native grasses and things like from the cattle people because that's the next step is going back especially native forges so um that's what we're doing."* Springfield participant 1: *"Um, I mean as far as like content, um I think we, we've or at least in my opinion where we're at in, as an industry I think there needs to be more information or research out there on carcass and genetics and that type of thing. Um and of course there's always, always room for more reproduction and and production research and info but um, I think it's time we kind of need to start, we've started to*

build the base now let's, we're so far behind in the goat industry behind the cattle, and the sheep and the hogs as far as genetics and EPD's and carcass data that now it's time that we need to start building on what we've already got. I think that where there's kind of a lag and part of it is I know it's hard to get funding for projects at the University level and it's hard to get government backing for a goat but um it'd be nice to see if you know we could get some goats in the Clay Center or some of those, those research facilities and start to build on some, somemore in depth stuff. "

The Springfield participants suggested starting research early was key, so those beginning producers can find what works and what does not. Focus group participants also said sometimes they run into finding information out "after the fact" which has led to poor practices.

There were instances where focus group participants were, in fact, able to find information about meat goat production and practices. Focus group participants suggested university staff, networking, 4-H staff and farm conferences aided in their research and education. Jefferson City participant 1: *"I do think 4-H has like for us, treating them was a huge starting part for us, education wise we got you know they told us what to do and what not to do the first year"*

Participants also said that some internet searching could be beneficial, depending on where you are looking. Springfield participant 2: *"Well, participant X used to use the internet on just putting out questions there for folks to answer, but uh, good folks at Lincoln University, Dr. Charlotte. We've been to some of her workshops and she's the one that told us about thisinternet place about being peer reviewed so you know you're getting accurate information. And whenever we see her name or any other workshop about goats advertised in the farm papers we try to go to."*

Participants suggested that as a producer you must do what makes the most sense for you, on your own operation, because what works for one does not work for all. Jefferson City participant 6: *"...and I think you have to figure out does it make sense for you"* Some participants have found that veterinarians are knowledgeable. Further some participants also felt farm visits to those with well-established operations helped them to better understand how to run their own farms.

Limited Access to Financial Support. The research protocol did not include any specific information on finances for any of the groups. Therefore, there was no evidence provided by the focus groups regarding access to financial support.

Conclusion

In conclusion, goat producers perceive demand for goat meat is rising and how beneficial meat goats can be to an already established operation especially in terms of brush control and interspecies grazing. Missouri goat producers believe meat goats can be easy to produce, if you have an idea of how to raise them to begin with. Meat goats are great for multispecies grazing for cattle and for brush control around the farm or on another's farm. However, time can be an issue if you have a lack of knowledge, and accurate information about meat goats is not always readily available. Producers do not feel veterinarians are adequately knowledgeable, or willing to pass information to them. Additionally, startup costs can be an issue because most do not have farms equipped for goats (fencing, predator control, etc.). Cost can also be an issue when it comes to disease prevention and hoof issues as veterinarians cannot prescribe most drugs for use on goats, so other "home remedies" must be used.

Participants also see issues with being able to keep up with the growing demand they see for goat meat, both because of the small herd size most producers have and the fact that most do not have kids year-round to meet the ethnic market demand. It is also difficult for the producer to sell meat goats on the hoof because of a lack of structure in the market. They are unaware of where to take their goats to sell and when each market will have small ruminant sales. This study has limitations that must be considered with the conclusions drawn above. Differences in researcher ability and knowledge could be considered a limitation. As well as the bias that could have been introduced by having two researchers well known in the Missouri goat industry. Future research to be conducted will include a quantitative study, processor interviews and further research into consumer preferences. This study is exploratory in nature and should be viewed as suggestive evidence.

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APPENDICES

Appendix A. Kappa Coefficients

Code	File	Kappa	Agreement	A and B (%)	Not A and Not B (%)	Disagreement	A and not B (%)	B and not A (%)
Brush, Multispecies Grazing Against	Jefferson City	0	98.81	0	98.81	1.19	0	1.19
Brush Multispecies Grazing Against	Kirksville	1	100	0	100	0	0	0
Brush, Multispecies Grazing Against	Springfield	0	98.89	0	98.89	1.11	0	1.11
Brush, Multispecies Grazing For	Jefferson City	0.0018	94.99	0	94.99	5.01	0	5.01
Brush, Multispecies Grazing For	Kirksville	0	97.39	0	97.39	2.61	2.61	0
Brush, Multispecies Grazing For	Springfield	0.4431	98.65	0.55	98.09	1.35	0.45	0.9
Challenge	Jefferson City	0	92.51	0	92.51	7.49	0	7.49
Challenge	Kirksville	0.0274	95.46	0.08	95.38	4.54	4.36	0.18

Challenge	Springfield	-0.0035	94.73	0	94.73	5.27	5.09	0.18
Limited Access to Financial Support Against	Jefferson City	1	100	0	100	0	0	0
Limited Access to Financial Support Against	Kirksville	1	100	0	100	0	0	0
Limited Access to Financial Support Against	Springfield	1	100	0	100	0	0	0
Limited Access to Financial Support For	Jefferson City	1	100	0	100	0	0	0
Limited Access to Financial Support For	Kirksville	-0.0007	99.66	0	99.66	0.34	0.04	0.3
Limited Access to Financial Support For	Springfield	1	100	0	100	0	0	0
Limited Expertise and Information Against	Jefferson City	0.0013	98.5	0	98.5	1.5	0	1.5

Limited Expertise and Information Against	Kirksville	0.2023	96.02	0.56	95.46	3.98	2.72	1.26
Limited Expertise and Information Against	Springfield	0.3959	97.06	1.02	96.04	2.94	1.29	1.65
Limited Expertise and Information For	Jefferson City	0	94.54	0	94.54	5.46	0	5.46
Limited Expertise and Information For	Kirksville	0.3992	98.33	0.57	97.76	1.67	0.53	1.14
Limited Expertise and Information For	Springfield	0.3587	92.68	2.41	90.28	7.32	4.48	2.84
Less Labor Intensive Against	Jefferson City	0	95.87	0	95.87	4.13	0	4.13
Less Labor Intensive Against	Kirksville	0.4148	98.29	0.63	97.66	1.71	1.45	0.26
Less Labor Intensive Against	Springfield	0.407	98.02	0.7	97.32	1.98	0.32	1.66
Less Labor Intensive For	Jefferson City	0	97.92	0	97.92	2.08	0	2.08

Less Labor Intensive For	Kirksville	0	98.52	0	98.52	1.48	1.48	0
Less Labor Intensive For	Springfield	0	99.29	0	99.29	0.71	0.71	0
Low Startup Cost Against	Jefferson City	0	99.25	0	99.25	0.75	0	0.75
Low Startup Cost Against	Kirksville	-0.0034	99.29	0	99.29	0.71	0.44	0.27
Low Startup Cost Against	Springfield	1	100	0	100	0	0	0
Low Startup Cost For	Jefferson City	0	98.47	0	98.74	1.53	0	1.53
Low Startup Cost For	Kirksville	1	100	0	100	0	0	0
Low Startup Cost For	Springfield	1	100	0	100	0	0	0
Marketing Goat Meat Against	Jefferson City	0	97.98	0	97.98	2.02	0	2.02
Marketing Goat Meat Against	Kirksville	-0.0096	98.01	0	98.01	1.99	1.2	0.79
Marketing Goat Meat Against	Springfield	0	99.71	0	99.71	0.29	0	0.29
Marketing Goat Meat For	Jefferson City	0.0007	97.49	0	97.49	2.51	0	2.51

Marketing Goat Meat For	Kirksville	-0.026	91.68	0	91.68	8.32	6.76	1.56
Marketing Goat Meat For	Springfield	0	96.16	0	96.16	3.84	3.84	0
Opportunities	Jefferson City	0.0003	93.15	0	93.15	6.85	0	6.85
Opportunities	Kirksville	0.571	98.64	0.93	97.71	1.36	1.34	0.03
Opportunities	Springfield	0	97.46	0	97.46	2.54	2.54	0
Control of Internal Parasite For	Jefferson City	0	97.19	0	97.19	2.81	0	2.81
Control of Internal Parasite For	Kirksville	0.3887	99.3	0.23	99.07	0.7	0.17	0.53
Control of Internal Parasite For	Springfield	0.5884	99.64	0.26	99.38	0.36	0.36	0
Control of Internal Parasite Against	Jefferson City	0	99.41	0	99.41	0.59	0	0.59
Control of Internal Parasite Against	Kirksville	0	99.34	0	99.34	0.66	0.66	0

Control of Internal Parasite Against	Springfield	1	100	0	100	0	0	0
Prolific Nature of Goats Against	Jefferson City	0	99.27	0	99.27	0.73	0	0.73
Prolific Nature of Goats Against	Kirksville	0	99.02	0	99.02	0.98	0.98	0
Prolific Nature of Goats Against	Springfield	1	100	0	100	0	0	0
Prolific Nature of Goats For	Jefferson City	0	97.89	0	97.89	2.11	0	2.11
Prolific Nature of Goats For	Kirksville	0	99.78	0	99.78	0.22	0.22	0
Prolific Nature of Goats For	Springfield	1	100	0	100	0	0	0
Rising Demand for Goat Meat Against	Jefferson City	1	100	0	100	0	0	0
Rising Demand for Goat Meat Against	Kirksville	0.2003	98.59	0.18	98.41	1.41	0.7	0.71
Rising Demand for Goat Meat Against	Springfield	1	100	0	100	0	0	0

Rising Demand for Goat Meat For	Jefferson City	0	98.37	0	98.37	1.63	2.73	1.63
Rising Demand for Goat Meat For	Kirksville	0.0136	96.50	0.05	96.45	3.5	1.01	0.77
Rising Demand for Goat Meat For	Springfield	0.3287	98.42	0.4	98.02	1.58	0	0.57

Appendix B IRB Approval

From: irb@missouristate.edu [mailto:irb@missouristate.edu]
Sent: Monday, October 10, 2016 8:48 AM
To: Onyango, Benjamin M <BenjaminOnyango@MissouriState.edu>; Walker, Elizabeth L <EWalker@MissouriState.edu>
Subject: IRB-FY2017-7 - Initial: Initial Approval

Missouri State
UNIVERSITY

To:
Benjamin Onyango
Agriculture - SPFD Campus
Elizabeth Walker

RE: Notice of IRB Approval
Submission Type: Initial
Study #: IRB-FY2017-7
Study Title: Perspective of stakeholders in goat production in Missouri.
Decision: Approved

Approval Date: Oct 9, 2016
Expiration Date: Oct 8, 2017

This submission has been approved by the Missouri State University Institutional Review Board (IRB) for the period indicated.

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented. Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB.

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable.

Researchers Associated with this Project:
PI: Benjamin Onyango
Co-PI: Elizabeth Walker
Primary Contact: Benjamin Onyango
Other Investigators: Christine Sudbrock, Melissa Remley, Samantha Riley