Developing a Qualitative Needs Assessment Tool to be Used by the Cooperative Extension Professional Working with Beef Producers

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Abstract

Cooperative Extension professionals have long relied heavily on a needs assessment approach to lay the foundation for the creation of educational opportunities that are both applicable and pertinent in meeting the historically assumed goals of increased profitability and sustainability in agriculture production. Utilization of a formalized needs assessment approach has the proven potential to be utilized by the Extension agent in the development of understanding with clientele; along with ultimately serving to assist in the identification of needs that are specific to the individual communities in which agents serve. Educational programming and resource allocation plans can then be developed, post needs assessment, with mind to the specific needs identified as a result of the process. Traditional needs assessments can be carried out through a multitude of mediums; to include surveying, interviews, advisory committees, focus groups, community forums, the use of existing data, and any multitude of mixing and matching of the aforementioned. Regardless of the chosen medium, the true value of needs assessment for Extension programming relies on its ability to successfully identify stakeholder needs, and to be empowered with the necessary information to design programs, products, and services to ultimately meet those needs (Garst & McCawley, 2015).

Through the identification of agricultural producers’ goals and production limitations, the Extension agent is armed and empowered with information that is necessary in the creation of successful agriculture education program design and the further development of services provided within their communities. It remains important for Extension agents to be able to “meet clients where they are at.” Feelings, goals, and production limitations have significant potential to stand as limiting factors to educational uptake, if not addressed, in programming that has been historically centered around increased profitability and sustainability. Without identifying producer goals, motivation, and addressing limiting factors to production within education, the Extension professional may face challenges in terms of programmatic impact and buy-in. An educator must exhibit considerable objectivity in working with public and they sometimes tend to assume they know what is best for their clientele (Boone et al., 2002). Increased profitability and sustainability seem to be the low-hanging, easily identifiable need of agriculture education; however, this historical belief may not be the case for
the majority of contemporary program participants. If nothing else, this assumption is worth investigation by the contemporary Extension professional who has the ultimate goal of meeting current needs within a contemporary clientele base. The ever-changing agricultural climate and an aging agriculture producer pool make it all the more important for contemporary Extension professionals to be proficient at identifying the current needs of agriculture producers in the geographic area that they serve.

The purpose of this project is to create a replicable, easily applied methodology that can be used to assess the educational needs of beef producers throughout Central Virginia. Locality based needs will primarily be determined by the identification of producer identified operational goals and the limitations that producers face in meeting those personal operational goals via interview. The information collected during the producer centered interviews will then be evaluated for key, repeatable themes and eventually have the capability to be applied by local Extension professionals to determine educational focus; ultimately determining and affecting local, available Extension resource application.

This project successfully identified both beef producer goals and the specific production limitations faced within a set locality and programmatic focus of Extension service. The project also served to produce a roadmap of determined importance for addressing both goals and limitations within educational programming, based upon the frequency of response within the saturated sample of project participants. The interview protocol and needs assessment approach developed through this specific project shows the potential to benefit both beginning career Extension agents, as well as long term career agents, in the tasks of identification and prioritization of addressed educational topics, resource allocation, and relationship building within a community. The project shed light on the importance of providing specialized educational resources and how Extension can better serve a contemporary clientele base moving forward.
Table of Contents

Introduction.......................................................................................................................... 5
  a. Background and Setting................................................................................................. 5
Statement of the Problem ....................................................................................................... 7
  b. Significance of the Problem.......................................................................................... 9
c. Purpose of the Project ................................................................................................... 11
d. Project Objectives ......................................................................................................... 11
e. Project Limitations ......................................................................................................... 13
f. Definition of Keywords/Terms ....................................................................................... 14

Review of Literature ........................................................................................................... 15
  a. Review of Literature ..................................................................................................... 15

Project Methodology and Design....................................................................................... 18
  a. Design: Theoretical Framework .................................................................................. 18
  a. Methodology: Qualitative ........................................................................................... 21
  b. Data Collection ........................................................................................................... 25

Summary of Outcomes, Discussions, and Recommendations ........................................... 30
  a. Project Outcomes and Results .................................................................................... 30
  b. Project Outcomes and Results Analysis ...................................................................... 46
c. Implications, Impacts, and Recommendations ............................................................ 47
d. Dissemination Plan ........................................................................................................ 49
e. Conclusion ................................................................................................................... 50

References.......................................................................................................................... 54

Appendices.......................................................................................................................... 57

List of Figures

Figure 1. Previous Interaction with Virginia Cooperative Extension .................................... 33
Figure 2. Producer Identified Operational Goals .................................................................. 34
Figure 3. Quotes Supporting Operational Goal of Raising Better Cattle/Increase Quality .... 34
Figure 4. Quotes Supporting Operational Goal of Farming Lifestyle Continuation .......... 35
Figure 5. Quotes Supporting Operational Goal of Sustainability ....................................... 35
Figure 6. Quotes Supporting Less Frequently Identified Operational Goals ...................... 35
Figure 7. Producer Identified Production Limitations .......................................................... 37
Figure 8. Quotes Supporting Production Limitation of Land .............................................. 37
Figure 9. Quotes Supporting Production Limitation of Available Labor ............................ 38
Figure 10. Quotes Supporting Production Limitation of Current Economic Climate .......... 39
Figure 11. Quotes Supporting Production Limitation of Government Regulations ............ 39
Figure 12. Quotes Supporting Production Limitation of Input Costs ................................. 40
Figure 13. Quotes Supporting Production Limitation of Negative Attitudes of Public Towards Traditional, Production Agriculture ......................................................... 40
Figure 14. Quotes Supporting Less Frequently Identified Production Limitations ............ 40
Figure 15. Producer Identified Educational Resources ....................................................... 43
Figure 16. Quotes Supporting Most Frequently Used Educational Resources .................. 43
Figure 17. Producer Identified Reasons for Frequenting an Educational Resource ............ 45
Figure 18. Quotes Supporting Reasons Why Educational Resources are Frequented Most Often .... 45
Introduction

a. Background and Setting

Cooperative Extension, an education and outreach body, has long aimed at delivering research-based information, originating from the Land Grant University, directly to local communities in an informal educational setting. Extension professionals help individuals put scientific knowledge to work through learning experiences that improve economic, environmental, and social well-being (Mission and Core Values, 2014). Extension’s roots go back to agricultural clubs and societies, which sprang up after the American Revolution in the early 1800s, and in 1819, a pioneer agriculture journal entitled American Farmer encouraged farmers to report on their achievements and their methods of solving problems (Cooperative Extension History, n.d.). Agriculture-based Extension efforts were thus developed upon, have focused on, and continue to strive to deliver cutting-edge agriculture technology and research-based solutions directly to those agricultural producers involved in Extension programming. Traditionally, Extension-based, agricultural programming has been centered around teaching agriculture technology and solutions geared at increasing a producer’s profitability, and thus ultimately increasing farm sustainability. It is both an expectation and long-term impact goal that the knowledge, skills, and technology presented through Extension programming increase agriculture profitability; that profitability be measured in quantitative form, and ultimately reported as economic impact to key program stakeholders.

In order to make the educational opportunities offered applicable, pertinent, and able to meet the goal of increased profitability and sustainability, agriculture Extension professionals have relied upon a needs assessment approach to determine those needs specific to the communities that they serve. Educational programming can then be developed in order to meet those specific needs once identified. Needs assessments can be carried out through a multitude of mediums; to include surveying, interviews, advisory committees, focus groups, community forums, and the use of existing data. The act of needs assessment by the Extension agent involves ascertaining the current circumstances, understanding what is desired by clientele in the future, and comparing the two (Altschuld & Watkins, 2014). The true value of needs assessment for Extension programming relies on its ability to successfully identify stakeholder needs, and to be empowered with the
necessary information to design programs, products, and services to ultimately meet those needs (Garst & McCawley, 2015). A successful needs assessment provides the necessary foundation for Cooperative Extension to carry out its original, historic mission throughout the times.

Virginia Tech's beef cattle Extension programs help serve the beef cattle industry as a whole by addressing and including each of the industry segments. The primary focus of these programs, has historically been and remains, to enhance the profitability and sustainability of beef cattle production systems through enhanced production efficiency and value-added ventures (Beef Cattle Extension, 2022). In order to be able to carry out this primary focus, the Extension professional must first identify the needs of their local communities. Cattle production is the most important agricultural industry in the United States, consistently accounting for the largest share of total cash receipts for agricultural commodities (Sector at a Glance, n.d.). In 2021, cattle production is forecasted to represent about 17 percent of the $391 billion in total cash receipts for agricultural commodities in the United States (Sector at a Glance n.d.). The rich agricultural resources in Virginia, including the topography, length of the growing season, soil, water availability, and climate contribute to successful and abundant forage production in the state. Abundant, available forage lends to Virginia being noted as a major player in beef production in the United States. The Virginia cattle and calf inventory for January 1, 2021 was estimated at 1.39 million head according to the Virginia Field Office of the USDA's National Agricultural Statistics Service (Ellison, 2021).

The scope and economic importance of beef cattle production make it imperative for the agriculture Extension professional in Virginia to be well versed at identifying the specific educational needs of beef producers within the communities that they individually serve. Virginia beef producers make a significant contribution to the beef industry as a whole. With the abundance of natural resources as primary supporting players to beef production in the state, specific challenges to beef production still exist. Multiple beef producer educational needs assessment projects have been conducted on a National scale and regional scales alike; however, Virginia producers face specific production challenges that are in and of their own. Those production challenges are not only specific to Virginia, but also specific to smaller, segmented production regions that exist within the larger state as a whole. This can be attributed to the variance of terrain across the state, differing...
marketing options across regions, historical access to educational professionals and programming, and the overall significant variance within production settings, and producers alike, that exist within the state lines. It is assumed that these regional specific challenges, not only manifest as differing production goals and limitations in relation to those faced in other parts of the U.S., but that they also unveil to be significantly different across the separate production regions that exist within the state. Many of those challenges are centered around the presence of the primarily endophyte infected native fescue pasture, above average heat and humidity during the summer months, and the increased and continually rising population density of the region.

In order to remain competitive, by national beef production standards, producers in the state have readily and consistently adopted scientific-based, agriculture technologies to boost their bottom lines and improve the production of beef cattle in the state. In order to persist, producers must continue to overcome production challenges specific to not only the region, but to their individual production settings. This may include meeting their personal production goals and overcoming operational limitations in order to do so. A greater understanding, gained through the needs assessment process, of beef producers’ goals and limitations that is specific to a geographic area provides the Extension professional with a roadmap to better assist in the creation of applicable, pertinent educational content and the allocation of educational resources to maximize programmatic impact. The current economic climate in agriculture and the continually aging pool of beef producers further increases the importance of successful, contemporary needs assessment in a defined geographic region, specific to the Extension professional tasked at serving that physical area.

**Statement of the Problem**

During the 20th century, rural life and American agriculture, in particular, experienced significant changes. Early 20th century agriculture was labor intensive, and it took place on many small, diversified farms in rural areas where more than half the U.S. population lived (*Farming and Farm Income*, n.d.). Agricultural production in the 21st century, on the other hand, is concentrated on a smaller number of large, specialized farms in rural areas where less than a fourth of the U.S. population lives (*Farming and Farm Income*, n.d.). Agriculturally centered Extension education, in many cases, tends to continue to operate under the historic assumption that the majority of agriculture producers are primarily concerned with operational profitability. About 89 percent of
current U.S. farms are classified as small, with gross cash farm income less than $350,000, with the households operating these farms typically relying upon off-farm sources for most of their household income (Farming and Farm Income, n.d.). In contrast, the median household operating large-scale farms earned $402,780 in 2020, and most of that came from farming (Farming and Farm Income, n.d.). Those statistics can lead me to the assumption that the majority of farmers (small farm owner/operators) in the U.S. operate their agricultural enterprises for reasons other than profitability. It may also be assumed that the beef industry is bifurcated, into small farms that rely on off-farm income to remain in operation and larger, commercial operations that rely upon profit to remain in production. Data surrounding this type of information can be particularly important as it relates to Extension program design; making assumptions on the matter dangerous. Through the employment of the needs assessment tool (Appendix) designed for this project, I can avoid the need to make assumptions regarding production, production goals, and production limitations faced within the clientele that I specifically serve.

Through the identification of agricultural producers’ goals and production limitations, I will be armed with information that is more specifically suited to successful agriculture education program design in the beef producer education group that I serve. Feelings, goals, and production limitations have the potential to stand as limiting factors to educational uptake of programming that has been historically centered around increased profitability and sustainability. Without identifying contemporary producer goals, motivation, and addressing limiting factors through education, I may face challenges in terms of programmatic impact and buy-in in the current climate.

It is well known that an educator must exhibit considerable objectivity in working with public and they sometimes tend to assume they know what is best for their clientele (Boone et al., 2002). Though increased profitability and sustainability may seem to be the low-hanging, easily identifiable need of agriculture education in my mind, this may not be the case for the majority of contemporary program participants. If nothing else it is worth taking a look at and exploring further. The assumption that Extension agriculture education need be centered solely around increasing profitability and sustainability, though historically the thought, may not be pertinent to contemporary clientele. The ever-changing agricultural climate makes it especially important for
Extension professionals to be proficient and able to identify the needs of the producers in the area that they serve and develop programming that fulfills the identified needs; whatever those may be. The first step to that is identification of producer goals and limitations. In other words, meeting clients where they are at.

Extension has helped the USDA implement its main objectives in developing the rural economy, training tomorrow’s leaders, disseminating knowledge, and pursuing sustainable agriculture and the environment since WWII (Wang, 2014). The contributions of the Extension system to farming communities in the rural United States seems to be a straightforward concept (Wang, 2014). However, historically speaking, those efforts have proven very hard to quantify. It is widely agreed upon that Extension has been a major player in disseminating new agriculture technology, given a smaller budget relative to classic Research and Development; however, it still remains difficult to quantify Extension’s economic benefit, or to separate it from that of University Research and Development efforts and other local resources (Wang, 2014). In recent times, Extension has also faced restriction to its total economic impact due to decreasing local Extension capacity. The number of full-time-equivalent (FTE) Extension personnel dropped by 12 percent from 1977 to 1997 (Ahearn et al., 2003). The Extension system is built upon a very unique partnership between the Land Grant University, the federal government, state government, and local governments. Over past decades, Extension funding has come to rely more heavily on sources within the states. Extension funding, in terms of constant dollars (dollars after adjustment for inflation), has declined. This has led to the number of Extension FTEs declining significantly over time and across regions (Wang, 2014). Given the downsized state of the Cooperative Extension system, in terms of both real dollars and personnel, the programming focus has had to change and adapt to fulfilling the needs of a state and local funding base in order to secure future funding. Extension must find ways to adjust to the tightening constraints brought about by budget cuts. Challenges await as Extension enters its second century of existence. Those challenges push past budget cuts and include changing roles and new, emerging issues in each of the program areas that the Cooperative Extension system strives to cover.

b. Significance of the Problem

The changing agriculture climate, the assumption of increasing economic and age limitations facing contemporary agriculture production, the proven difficulty in quantifying Extension’s economic impact, and the
continued decrease in local Extension capacity all serve as driving factors for the need of the contemporary Extension professional to be proficient in collecting feelings, goals, and production limitations among the local clientele that they serve. Not only does the qualitative data mined from this project serve to assist me in identifying local areas of current educational need, but it should also serve valuable in the quest to develop qualitative driven impact measures for the future.

This project will not serve to increase the number, density, or quality of Extension professionals hired in certain areas; nor will it serve to necessarily increase overall program impact or design on its own. However, upon the use and concentrated analysis effort of the results collected though the employment of the needs assessment approach developed through this project, I will be provided with an opportunity to gain a better understanding of local community needs, potential limiting factors to educational uptake, and of important factors that may shape qualitative impact goal setting for the future. With the specific producer driven information collected through this project, I should be able to do a better job designing programs based around the results; ultimately increasing my potential at enhanced programmatic impact though improved educational design. Successful accomplishment of this not only has the potential to lead to increased programmatic impact and buy-in within the population I serve, but also further insurance in securing future funding, and increased efficacy in communicating programmatic impact.

Communication is key in any partnership (Covey, 2009). Communicating programmatic impact to funding sources and program stakeholders is a requirement of the Extension professional. With that being said, it is oftentimes one of the many things that fall to the end of the to-do list in a demanding and dynamic profession. This is dangerous due to the ever-increasing importance that impact statement creation and sharing holds in the current Extension funding climate.

The needs assessment approach, along with the accompanying interview protocol tool, that was developed through this study will have the potential to be adapted to program area focuses other than agriculture and natural resources, to include positive youth development and family and consumer science programming areas. The tool’s goal of capturing feelings, goals, and limitations can prove valuable in all traditional, Extension programming areas. The utilization of this tool within a local program setting has the capabilities, through the
analysis of findings, to not only shape future development of educational programming and resource allocation, but can also provide a strong foundation to the Extension professional in developing a qualitative platform for impact reporting. Results from this needs assessment can also provide the established Extension professional with qualitative support to existing quantitative impact figures. Utilization of the tool developed within this study has the ability to strengthen or increase the important intangible of relationship building which is an important part of the Extension professional’s toolbox of skills; all the while, providing support and direction to the often-forgone impact reporting part of the job.

c. Purpose of the Project
The purpose of this project is to create a replicable, easily applied methodology that can be used to assess the educational needs of beef producers throughout the state of Virginia; with this project looking at the specific programming area and population in and around Orange County Virginia (Central Virginia). Locality based needs will primarily be determined by the identification of producer identified operational goals and the limitations that producers face in meeting those personal operational goals via interview. The information collected during the producer centered interviews will then be evaluated for key, repeatable themes and eventually have the capability to be applied by local Extension professionals to determine educational focus and ultimately determine and affect local, available Extension resource application. This project will also be used to qualitatively support a state-wide, beef producer survey aimed at quantifying beef producer marketing and selection methods which will be shared with industry stakeholders. The research questions for this project were designed to be centered around beef production. More specifically, they were designed to mine open-ended forms of qualitative data regarding the production goals and the limitations that are faced by contemporary beef producers. The simple identification of production goals and limitations lays the foundational approach of this project to better identify producer needs, and ultimately allow for the measurement and prioritization of those needs which are identified throughout the project work.

d. Project Objectives
The project will answer the following research questions:

1. What are the operational goals of Central Virginia cow-calf producers?
2. What are the limitations preventing Central Virginia cow-calf producers from reaching their operational goals?

3. What, if any, opportunity exists for Cooperative Extension to better address or incorporate producer goals and operational limitations into future education?

The hypothesis of this project is that through the collection of qualitative information, centered around beef production goals and limitations, I will have qualitative data to add to traditional quantitative needs assessment data collected via survey. This will ultimately increase my awareness and understanding of clientele and their current practices and behaviors. Upon analysis of the qualitative data collected in this project, there may be the potential for the development of ways to better address and incorporate the identified producer goals and operational limitations of the Virginia beef producer into future education. With the identification of production goals and limitations, I should also have access to information that holds power in increasing program participant buy-in and increased educational uptake. It is hypothesized that production goals and limitations, identified through the producer interview process carried out in this project, may have experienced some level of change or expanded as it compares to those traditionally and historically assumed or identified by myself in the past.

The final objective of the project is to increase clientele buy-in and satisfaction with beef-based Extension educational program design and offering which is developed around the findings of this project in conjunction with the findings of the next state-wide, beef producer survey. This objective will only be accomplished if I can ultimately design programming that is both applicable and mindful to the producer identified goals and limitations mined throughout the project work. The producer identified goals and production limitations were collected through a producer centered interview process. The project has the potential to be meaningful to both those producers participating in the needs assessment process and for myself, with the hope that simple participation in the project creates further mindfulness, respect, and a deeper understanding of each other for both parties. Utilization of the interview protocol tool (Appendix) developed in this project has value to both long-term and new to the job Extension agents. Completion of the producer
interviews should help the Extension agent, regardless of years of service, in the important relationship building process with local program participants.

e. Project Limitations

The project design may present as having certain limitations and potential challenges as it relates to the assurance of reaching a level of acceptable demographic variance within the project sample. For example, within the project results outlined below; through the use of the convivence sampling method to select participants, three of the ten total participants eventually included in the results, indicated that they had held some type of previous Extension employment. Though the extent of that employment was relatively limited (to summer internships and one year or less of an employment stint) it could be argued that through the study’s heavy inclusion of participants with previous Extension employment, could limit both the application and validity of the results collected. It is important to remember that this study was not geared to assess the needs of a defined, total sample population; nor was the project designed to ensure that both individuals with limited and extensive interaction with Virginia Cooperative Extension were included at equal rates in the project. The project methodology did not include the establishment of threshold levels for demographic variance within a defined sample. This concern holds true for all demographic indicators, past previous interaction with Cooperative Extension, that were identified and collected throughout the project work.

This limitation was addressed and, in my opinion, overcome by working to the point of saturation in question responses. Obviously in the methodology presented for this project, there lies the chance that an additional participant in the study may have had something new to add to the results collected. Ultimately, the level of demographic variance represented in the sample used for this project, along with my work to reach saturation in the responses of each question asked through the interview protocol, should cause this limitation to remain minimal, if present at all. Even through certain demographic indicators may have been more heavily represented in the sample this is still an effective means of needs assessment; especially when framed within a Cooperative Extension setting.

Should new to the job Extension agents adopt the project methodology and choose to utilize the needs assessment approach developed in this project, they could find limitation as it relates to interviewee selection.
This study relied on a historical contact list, held in my current office of operation, to solicit and enlist a portion of project participants. If those resources are not available to the Extension agent, that could add an additional level of challenge to overcome in project completion. In order to overcome this challenge, new-agents without strong historical contact databases and with limited situational networking, could potentially solicit advice and suggestions for project participants through interaction with office staff, coworkers in surrounding counties, key members of the community, Extension Leadership Councils, past holders of their current position, and others that may hold valuable historical knowledge in their individual settings. Seeking advice through the aforementioned avenues or individuals presents a professional networking and relationship building platform in and of itself. Should the number of program participants needed to reach saturation in the needs assessment process not be achieved, this project still holds value in terms of precipitating and catalyzing the important relationship building process that lays the foundation of a successful Extension career. The project has the potential to be used as a stand-alone relationship building tool, even if its original intended value as a needs assessment approach is foregone altogether due to saturation not being achieved. This project began to show significant range of motion and value to when viewed through an Extension relationship building lens upon completion. It led to undocumented, but increased, contact post interviews and began to reveal, though unmeasured at this point, a trust level increase between the clients that participated and myself as the primary investigator.

f. Definition of Keywords/Terms

Cooperative Extension Service: The Cooperative Extension Service is a joint effort between national, state, and county governments within the U.S. Its aim is to advance the practical application of knowledge through a wide variety of Extension and outreach activities. At present, this system pursues the following program areas: youth development (4-H), agricultural and rural development, natural resource management, family and consumer sciences, and community and economic development. The U.S. Extension system has traditionally focused on all aspects of rural development at the household and community levels (Heinz, 2015).

Extension Education/Programming: Over the past century, Extension education developed into a discipline or field of study with its own philosophy, objectives, methods, and techniques that should be understood and used
by most Extension professionals if they are to be effective in serving the needs of the community in which they serve. The basic principles, methods, and techniques of extension education are applicable to all fields within agricultural and rural development, including crop, livestock, fisheries, and other rural enterprises, as well as rural youth programs and home economics/science, including family health, hygiene, and nutrition (Heinz, 2015).

**Agriculture Technologies:** Until recently, agricultural technologies have largely been created and disseminated by public research institutions. However, over the past 50 years, the private sector has played an increasingly important role in producing and selling proprietary technologies in the form of production inputs, such as hybrid seed, pesticides, and mechanical technologies. Over the past two decades, biotechnologies have developed rapidly; especially as the agricultural economy has become more globalized. This development has boosted private investment in agricultural research and the transfer of these technologies. This phenomenon has expanded the influence of national and multinational corporations in supplying new technologies, especially to commercial farmers. At the same time, the public sector still has an important role to play in providing oversight of these new technologies; conducting research to fill the important technology gaps not being addressed by private-sector firms, especially for small and marginal farmers; and in continuing to develop and transfer sustainable natural resources practices to all types of farmers (Heinz, 2015).

**Needs Assessment:** Needs assessment is a process driven by the question, “What do clients need and how can those needs be met?” (Patton, 1982). A need is defined as a gap between “what currently is” and “what should be” (Altschuld & Watkins, 2014). Needs assessment is a process to identify what people need where they live, work or play. The purpose is to use the information gained to make plans to meet those needs. What are the needs of people you serve? ((Donaldson & Frank, n.d.)

**Review of Literature**

a. **Review of Literature**

Educators and researchers have historically relied upon the establishment and utilization of quantitative baseline measurements as it relates to important beef production topics; to include, but not limited to selection, marketing, and specific production practices. The collection and utilization of this quantitative information has
allowed for the advancement of education and research in the field; with the advancements being typically geared towards the ultimate goal of increasing producer profitability. With that being said, it remains important for Cooperative Extension to also collect qualitative data that relates to producer goals, production limitations, and producer’s perceived ideas and recommendations for how Cooperative Extension can better assist them, through education, in beef production moving forward. The combination of the qualitative information collected through the producer interviews in this project, with the planned state-wide collection of survey derived quantitative, production-based practice and producer demographic information allows for a more holistic view of producer educational needs and desires. This should ultimately result in the development of the most effective and impactful educational programming offering, specific to the cattlemen and women of Central Virginia.

Other states have implemented similar needs assessment projects aimed at beef production. The Michigan State University (MSU) Extension Beef Team conducted a survey during March, April, and May of 2019 to determine the educational needs of Michigan’s beef producers and beef allied industry professionals (Schweihofer et al., 2020). This survey collected both quantitative and qualitative data from across the state via the online platform, Qualtrics.

Auburn University conducted a qualitative study through an open-ended interview geared at identifying the key sources resistant to organizational change within the Extension System. Upon the conclusion of the interview process responses were then coded and organized into categories. Those emergent categories, identified through the qualitative inquiry process, were then used to create quantifiable survey items. The quantitative and qualitative data, used cooperatively, served as the foundation for the development of a systematic process aimed at addressing Extension faculty’s concerns, engaging stakeholders in the process, and creating a plan for implementing recommendations (Guion et al., n.d.).

Pennsylvania State University Extension conducted qualitative research to inform its efforts on environmental policy education. The researchers conducted key informant interviews focused on policy challenges, performance indicators, and future directions (Guion et al., n.d.). The report generated through this
research was eventually shared with numerous stakeholders and was used to guide future work on environmental issues (Dodd & Abdalla, 2004).

The previous studies shed light on the value within the Cooperative Extension system that key informant interviews, and specifically the qualitative data collected through the use of key informant centered needs assessment, holds. Further studies have sought to tease out and better illustrate the value to Cooperative Extension that greater engagement with program stakeholders breeds throughout the programming process. The cumulative programming process includes the initial step of needs assessment within a locality or group, which is the focus of my study. Pennsylvania State University conducted a formal study in 2018 that focused on the long-identified, but previously underdeveloped, interest in the greater engagement of Cooperative Extension within the communities it serves. This study developed the engaged model of program development within an Extension frame. The engaged model of program delivery in Cooperative Extension is characterized by community involvement in all aspects of program development: identification of issues to be addressed, construction of a process for implementation and development of knowledge, evaluation, and securing of funding (Vines, 2018). The engaged model is based on relationships with the community developed through continual interaction, partnerships, and collaborations (Vines, 2018). This may include, but is not limited to, the needs assessment stage of program development and planning. The study shed light on the value in incorporating the engaged model in both formal and informal Extension settings and the related implications within the Cooperative Extension system.

**Summary**

Qualitative research is oftentimes used for program planning along with evaluation in the Extension profession. Qualitative research will be used in this case to further develop and enrich my current understanding of stories behind the beef producers in the area I serve. The ultimate hope being, that a deeper understanding between clients and myself develops and that can assist me in future program planning and decisions. Qualitative methods are especially well suited for asking open-ended questions that can inform program delivery or explain evaluation findings (Guion et al., n.d.). An interview protocol was designed with this theory in mind through the development process. Dialogues with potential participants and other informants can be
used to inform key issues such as: high-priority community issues, specific target audiences, audience interests, and preferred educational methods. When conducting needs assessments, qualitative interviews or focus groups can be used alone or in combination with quantitative methods and survey data (Guion et al., n.d.)

Qualitative producer interview data from this project will afford Virginia beef industry leaders, research scientists and personnel, and Extension educators with a supplement to their already tangible, quantitative accounting of current beef management practices. The most recent, statewide beef producer survey was recorded 10 years prior to the dissemination of this producer interview project. This project served to supplement producer information that was accounted for in previous surveys; in turn, allowing for an opportunity to quantify progress and change. Past a brief accounting of traditional producer survey information, the producer interviews gathered qualitative data about the limitations that producers face in implementing their ideal forms of selection and marketing within their own operations. This information was not collected in previous Virginia cow-calf producer surveys. Through the engaged nature of this project, between beef producers and myself (Extension agent) relationship building appeared to be expedited and strengthened throughout the process.

**Project Methodology and Design**

**a. Design: Theoretical Framework**

Extension educators have long relied upon needs-based assessments to better accomplish the dissemination of information that is most pertinent to their specific clientele and assigned localities. Needs assessment is a process driven by the question, what do clients need and how can those needs be met? (Patton, 1982). A need is defined as a gap between “what currently is” and “what should be” (Altschuld & Watkins, 2014). The answers to these questions can help the Extension agent devise a plan in terms of educational programming development, program offering, resource procurement and pointed application; all aimed at meeting the identified needs of clientele. In short, a successful needs assessment can assist the Extension agent in the development of a plan of work that has the potential to be impactful and pertinent in their specific work environment and community.
Traditional needs-based assessments have the potential to overlook personal goals or to fall short in the identification of limitations that clientele is met with when striving to meet those personal goals. This can be attributed to the very strong historical assumption that the majority of all agriculture production centers around the ultimate goals of profitability and sustainability. This deeply embedded, historic assumption has the potential to lead to the biased development and design of needs assessment approaches and the questions contained within current needs assessment tools. The intent of this project was to create a repeatable, easily applied methodology that can be used to assess the contemporary educational needs of beef producers in Central Virginia. This methodology, and the subsequent interview protocol tool that was developed through the project work, strives to eliminate any previous historical bias and allow for the collection of open-ended, unbiased answers from project participants. Locality based needs were determined by the identification of producer identified operational goals and the limitations that producers face in meeting those personal operational goals. This information was then evaluated for key, repeatable themes and eventually showed the capability to be applied in an effort to determine future educational focus and the allocation of available Extension resources. The final goal of the project, though unmeasured at this point, being increasing clientele buy-in and satisfaction with educational program design centered around goal achievement and limitation acknowledgement. This has the potential to eventually lead to increased long-term impact and program buy-in by local educational program participants.

With the identification of producer goals, I can better formulate and design Extension programming that is centered around assisting those producers in meeting their goals. Locke and Latham provide a well-developed goal-setting theory of motivation which emphasizes the important relationship between goals and performance (Lunenburg, 2011). Research supports predictions that the most effective performance seems to result when goals are specific and challenging, when they are used to evaluate performance and linked to feedback on results, and create commitment and acceptance (Lunenburg, 2011). In this study, producers will be asked to identify and report their goals. In turn, providing me with a sort of roadmap to producer motivation. With this information, I should then be able to be more impactful and pointed in my educational efforts.
Past relying on the identification of producer goals to better shape educational programming in the Extension field, this project also focused on identifying limiting factors to production, as reported by the producer themselves. The Theory of Constraints is the name given to a series of decision-making techniques first created by Dr. Eliyahu M. Goldratt beginning around 1980 and later applied and augmented by a number of others (Blackstone, 2010). This theory has been applied in a variety of settings, first in areas of business systems and eventually in non-profit settings. The Theory of Constraints has also been applied in educational settings as it relates to decision making. The Theory of Constraints states that constraints (limitations) determine the performance of a system (Blackstone, 2010). A constraint is defined in the theory as anything that would prevent a system from reaching a higher level of performance as it relates to its goal. A system is defined as any collection of interconnected parts sharing a common goal (Blackstone, 2010).

Upon the identification of Central Virginia cow-calf producer production constraints or limitations, I am armed with the knowledge needed to be able to address the most-limiting factors to production first with educational programming. Should producers be able to address the most limiting factors first, they should be able to progress more efficiently and effectively at reaching their production goals. In turn, if production constraints are met and acknowledged during educational programming, I should see increased long-term programmatic impact. This (identifying and problem-solving most limiting factors) is something that producers regularly do in production; however, practicing Extension agents may overlook this important information in program design or find themselves making assumptions in the process. Beef producers are many times open to the adoption of new herd production and management technologies aimed at increasing economic success and sustainability within their individual operations. Extension programming has long centered around exposing and teaching educational program participants about up-and-coming agriculture technology to increase their economic viability within their own production settings. With that being said, this has been done at times without the initial recognition of producer limitations. For example, many producers do not have the facilities or necessary labor needed to incorporate timed-Artificial Insemination technology. Though they understand the economic advantages to incorporating such a technology, they may not have the handling facilities necessary to incorporate the technology into their programs. If I can identify those limitations to economically important
production practice; I can better address these barriers during educational presentation or educational program design.

a. **Methodology: Qualitative**

*Specific Research Design Used*

The research methodology used in this project was qualitative in nature. Over time, many different approaches to qualitative research have been identified and applied by researchers. The specific qualitative research design that this study utilized is a situation adapted form of narrative research. Narrative research is a design of inquiry from the humanities in which the researcher studies the lives of individuals and asks one or more individuals to provide stories about their lives (Riessman, 2020). Narratives in this study focused on beef operations, the number of years and individual has been involved in production, their most enjoyed parts of production, producer identified operational goals, and the limitations they face in meeting those goals. These producer stories were collected via interview methodology. The data collected through narrative research was used to answer research questions centered around the identification of current beef producer operational goals and the limitations that they may face in reaching those goals. Through a recorded narrative, I can hope to gain insight into producer farming operations; why producers do what they do. Often, in the end, the narrative research combines views from the participant’s life with those of the researcher’s life in a collaborative narrative (Clandinin & Connelly, 2000). Ultimately this information could prove valuable in identifying shared producer and Extension professional experiences in production; with the potential to lead to a relationship building experience between the interviewer and the interviewee. First-hand experience in beef production, on the part of the Extension agent, added to and assisted with the development of uncovering shared experiences. It is oftentimes through those shared experiences that trust begins to build between the Extension system and the clientele which it strives to serve. Individuals are more likely to respond and seek out knowledge and information from individuals that have first-hand knowledge and experience over a specific subject material. This thought was proven through the results surrounding educational resources gathered through this particular project. Should the Extension agent not have first-hand experience with beef production, the interview protocol (Appendix) for this project was designed in such a way to facilitate discussion where minimal background
knowledge is needed on the part of the interviewer over the subject material. My production background and first-hand knowledge and experience proved to be valuable in the relationship building process facilitated by this project; however, this is not a requirement of the interviewer. This methodology allows for the collection of data used to identify recurring themes and hopes within operations across the state, and ultimately allowed me to have a better understanding of producer feelings. Upon analysis of the information captured through this project I could access the potential to develop more successful and pointed educational programming to be offered in the future.

This project will differ from the MSU needs assessment project, and from many other state-wide needs assessments done in the past, in that it was interview based and aimed only at the collection of qualitative data. Further this project focused on collecting information that centered solely around the identification of producer goals and limitations; foregoing a full account of more traditional data typically collected in historic beef producer needs assessments implemented via survey form. The qualitative data collected through this project, though region specific and not inclusive of the state as a whole, has the ability to supplement quantitative state-wide data collected via survey if decided upon. The data collected in this survey was specific to the Central Virginia beef producer. Ultimately, the interview protocol tool (Appendix) developed in this project has the potential to be adopted and used in a singular county should an Extension professional decide to adopt the project in their individual respective service area.

This study differed from the Auburn Extension System study in that it focused on the agriculture and natural resources programming area. More specifically, beef production; with the potential of the developed interview tool (Appendix) to be adapted for use in other specialized Extension program areas. This study also differed in that if focused solely on the collection of qualitative data; with the potential for this information to support quantitative survey responses in its original qualitative form. In the Auburn study, qualitative data collection led to the development of quantitative survey questions that were eventually employed to gather the research information.

This study is very similar to the Pennsylvania State University environmental policy education study in terms of the goal in utilizing qualitative data to inform future educational design. However, this study used
convivence sampling; rather than seeking out specific key informants for participation. This project focused on collecting in-depth, narrowly focused, qualitative data with no prerequisite to participation in the project past an identified interest or assumed relation to beef production. Furthermore, this study was designed to focus on the identification of feelings, goals, and limitations to production and how those identifiers can potentially be used to inform and shape future Extension programming efforts. No mind was paid to Extension policy challenges, performance indicators, or future directions during the interview process. However, the information collected in this project has the potential to indirectly influence those things upon further, in-depth analysis.

Types of Data Sources

Qualitative researchers typically gather multiple forms of data, such as interviews, observations, documents, and audiovisual information rather than rely on a single data source (Creswell & Creswell, 2018). These are all open-ended forms of data in which the participants share their ideas freely, not constrained by predetermined scales or instruments (Creswell & Creswell, 2018). The interview protocol (Appendix) for this project was designed with all of the aforementioned in mind. Producer needs based information was collected through this study in the interview form that the producer participating choose. The assumption was made that the choice of interview participation medium would best facilitate the producer’s ability to share their ideas freely. That may take place in a natural, on-farm setting through a face-to-face interview, over the phone, or by Zoom meeting. This was ultimately the participant’s choice. Both the in-person and Zoom options would allow me to collect both audio data for transcription and to note visual observations throughout the interview. Should the producer interviewed choose a singularly audio version of accounts, over the phone, observations were still made in terms of tone, emotions, and openness to questions. Audio information was transcribed at the completion of the interviews. Video information, along with any other observations I made had the potential to be used to strengthen narrative. Notes on body language were recorded if noteworthy. Visual observation information could have also been used to create a narrative that supplemented the written account of events. Autonomy was presented as an option to participating producers in the study. This was accomplished by using surnames instead of the producer’s legal name and the video recording part of information collection was foregone in cases if this was chosen by the participant. Individuals comfortability in participation and ability to
choose the way in which information is collected from them was prioritized throughout this study; with the hope of ultimately decreasing limitations to participation, ensuring variability in the sample selected, and creating an easily applied methodology for other Extension professionals to employ in their own programs.

**Role of the Researcher**

The inquirer, or researcher, is typically involved in a sustained and intensive experience with participants (Creswell & Creswell, 2018) in this type of qualitative inquiry. This fact lends to the insured and insulated success of the longer-term Extension agent that plans to adopt this process and presents potential methodological issues for the newly hired, beginning career Extension agent such as myself. It introduces a range of strategic, ethical, and personal issues into the qualitative research process (Locke et al., 2014) of this specific project. The goal of this project was to not only to lay the framework for the secure, longer-term, insulated Extension professional’s success in need assessment, but to also lay the platform for success as it relates those newly-hired Extension personnel who may not be afforded sustained and extensive experience with program participants at the time of interview. In order to lay the groundwork and framework for success, this project touched indirectly on relationship building and trust development through the interview process in order to assess individual producer needs. I presented the producer with open-ended questions that were used to identify operational goals and operational limitations. These operational goals and limitations collected can then be used as the baseline for educational program development, impact evaluation, etc. I was unbiased in my approach and interpretation of both questions and answers. With that, a focus was made on remaining un-leading in question presentation. I also did my best to be seen and present as non-intrusive; while doing my best to build rapport with interviewees.

As the primary investigator to this project I brought six years of in-field Extension experience. Prior to my hiring as an Extension agent in Virginia, I worked for a National cattle breed association in multiple positions. All of the professional positions that I have held, and currently hold, have been aimed ultimately at education and service. Throughout those experiences, I have consistently noted and observed the importance of initially identifying the goal(s) and potential limitations of clientele; the importance and weight that those two pieces of information ultimately hold in guiding my response and increasing customer satisfaction and impact in
the end. I have also noted the number of assumptions that I make in identifying goals and limitations of clientele without directly asking them those two, ever-important questions. The goal of this project was to give myself, and other Extension agents, an applicable approach that I could reference for identifying those two important pieces of information (goals and limitations) and removing the common practice of assumptions made on the part of the busy, practicing Extension agent. This project served to provide a tool that can simplify the art of meeting people where they are at in the quest to educate.

b. Data Collection

*Interviewee Selection*

Convenience sampling (also known as accidental or “man-in-the-street” sampling) was used for this particular study. Convenience sampling is a type of nonprobability (or non-random) sampling that is commonly used in the qualitative research realm. In the execution of this particular selection technique, interviewees were selected based upon their availability or convenience to the investigator (in this particular study, myself) conducting the interviews. Availability was determined by a multitude of factors; to include: location (living in the county or counties that I currently serve), contact information being available through existing office database records, membership lists, attendance at an Extension or agriculture-related event, previous Extension program participation, previous interactions with either myself or Extension office, etc.). Participants were selected initially through contact with either myself or the Extension office over a set one-month time period. The only prerequisite to participant selection was an involvement with beef production, which was determined through the interaction. Upon the conclusion of the month-long participant selection period, program participants were selected, at random, from the membership list of the Central Virginia Cattlemen’s Association (CVCA). This membership list, which included current contact information, was used to enlist further project participants until saturation was reached in the project.

This project focused on a pilot group of beef producers located in Central Virginia; the majority of which are involved in the Central Virginia Cattlemen’s Association (CVCA). This group of producers served as the participants in this study and the interviews were conducted by the historically associated Extension agent who serves the group from an educational standpoint as the local Extension agent (Orange County, Virginia),
which is myself. The ultimate goal was for me to be able to provide an example needs assessment approach that other Extension agents could use and replicate in the counties that they personally serve. In order to obtain a successful needs assessment, representative of the entire population in this Association group, I relied upon saturation being reached in the interview process. When no new information was presenting through the interview process, I assumed that an appropriate level of demographic variance had been reached as well.

I attempted to ensure demographic variability in participants, and more importantly frame results, through the collection of data on a series of demographically related questions that were asked at the beginning of each interview; with the ultimate goal being to show variance among those demographic indicators reported by interview participants. The demographic questions, aimed at reducing bias, were based around age, gender, race, size of operation, number of years farming, and employment status (full or part-time farmer, the primary occupation of farming, or holding a primary occupation other than farming), previous Extension programming involvement, and membership status to other cattlemen’s groups (past CVCA) for this particular study.

Convenience Sampling

Convenience sampling has the reputation of not being either purposeful or strategic in nature in the academic community. Convenience sampling for qualitative research depends on the motivation of those who participate in the research; introducing motivation bias into the study (Stratton, 2021). Motivation to participate may depend upon the interest that one has in the research topic, a wish to express a disgruntled point of view, or a desire to support one’s specific opinions (Stratton, 2021). Convenience sampling also introduces the possibility of selection bias; participants may not be representative of the population as a whole.

Historically speaking, the demographic variance of agriculture producers has remained low. Though this statement has changed some over time due to societal changes, the USDA NASS, 2017 Census of Agriculture shows that a relatively low deviation in demographic data still exists as it relates to agriculture producers in the United States. Based on the 2017 Census of Agriculture, 64% of U.S. agriculture producers are male, with the remaining 36% being female. In terms of age, 8% of U.S. agriculture producers are under the age of 35, with 58% between the ages of 35-64, the remaining 34% of producers are over the age of 65. U.S. agriculture producers report as being over 95% white. Implementing an alternative sampling technique to convenience
sampling, or a technique that is designed around the maximization of demographic variance; in particular, as it relates to age, race, and sex, can become challenging in a target sampling population that exhibits slight demographic variance in the total population (such as beef producers). Due to the inherent, more limited demographic variance in the population sample that was utilized for this project, convenience sampling was appropriate. Many times, Extension personnel face challenges in defining the total sample population and procuring contact information that is necessary in this project to secure participants. This, along with the inherent limited demographic variance of beef producers in the United States, lends to convenience sampling being an appropriate sampling method for this particular study. In order to best decrease and avoid selection bias, this study relied upon the collection of demographic data at the beginning of the interview process. The best effort was made by myself to vary those indicators to the best of my ability, and in relation to the sample group that I had available to me within the constraints of my specific position. The study primarily relied upon the utilization of a sample size that was large enough to reach the occurrence of saturation in interview responses; thus, best ensuring the absence of bias within the dictated parameters of the study.

Convenience sampling could be considered ethically appropriate in the case of conducting a needs assessment for Extension education as Extension resources are oftentimes limited. The hopes of this project were to develop an easily replicable, applicable needs assessment tool that could be utilized by Extension agents at any stage of their careers, new and beginning or established. In order to do so, mind was given to the simplicity of sampling, ease of data collection, time needed to carry out the assessment, and the costs associated with the sampling method. Convenience sampling is cited by the academic community as simple to conduct, the data collected through this methodology is able to be facilitated in a short amount of time, and it remains the cheapest sampling method to implement; all as relates to alternative sampling methods. Convenience sampling has been noted as helpful in the completion of pilot studies or hypothesis generation.

On-farm studies and producer interviews hold an inherent advantage in terms of realism as it relates to other methods of needs assessment collection used historically in Cooperative Extension services. In order to carry those out, access to the participants is required; ultimately lending itself to the high possibility of utilizing participants that have previously shown buy-in through past Extension educational activities. Luschei recently
conducted and published research where a convenience sample of on-farm research cooperators proved to be representative of Wisconsin farmers as a whole. The findings of this study support the notion that the convenience samples, often associated with on-farm research interviews, may be representative of the more general class of farms, despite the obvious lack of bias protection provided by truly randomized designs (in the case of this project, convenience sampling) (Luschei et al., 2009).

Sample Size

Appropriate sample size for a qualitative study is one that adequately answers the research question (Marshall, 1996). In practice, the number of required subjects usually becomes obvious as the study progresses, as new categories, themes, or explanations stop emerging from the data (data saturation) (Marshall, 1996). The term saturation stems from grounded theory. Charmaz said that one stops collecting data when the categories (or themes) are saturated: when gathering fresh data no longer sparks new insights or reveals new properties (Charmaz, 2014). Upon this phenomenon occurring an adequate sample has been reached. For this study, it was anticipated that the number of interviews would be 10-12 before saturation had been reached. Saturation was determined to be reached at ten participants in the study.

Data Collection Procedures

All interview conversations were recorded in order to accurately capture the data presented. Participants were given the choice of interviews being conducted via Zoom, by telephone, or in-person. They were able to select the method that they were most comfortable with and most easily able to participate through. Through each potential interview mode (Zoom, telephone, or in-person) two separate means of recording equipment was used to ensure that interview data was collected even if a singular mode of recording technology should malfunction or fail. These recording means could have included, Zoom, phone, handheld device for recording, or any other technology that supported voice capturing. For the purposes of this study, both a handheld recording device and an iPad were used to record producer interviews, regardless of the medium that interviews took place. Those recording devices were chosen based upon their availability to me; this choice did not in any way effect the validify or quality of the study itself.

Recruitment Strategy for Enrolling Participants
I began soliciting voluntary participants to participate in the interviews spanning a month-long time period. Willing participants were enrolled in the project as they were conveniently met by myself during normal work requirements. Participants were selected based on close proximity and/or interactions with the Extension agent during that selected month-long period; with the only other prerequisite for participation being an involvement with beef production. Individuals that came in or called the Extension Office during this month, and that were involved in beef production, were then evaluated for willingness to participate and enrolled in the study. The 10-12 individuals that were assumed needed to reach saturation was not filled by the end of the month. The CVCA member contact list was then consulted, and individuals were contacted at random off of the contact information in that list to solicit participation. Those participants were selected using a random sort in Excel. The utilization of that contact list allowed no limit to participation in those individuals selected for the study due to their usage of the Extension Office during the designated month when participant selection took place.

Validity and Final Uses for Data Collected

The final data that was collected served as a needs-based assessment for myself. The qualitative data also has the potential to be used to develop or to supplement an existing impact statement or to share with program stakeholders. The project was reviewed by the Intuitional Review Board (IRB) and was deemed not human subjects research. This process, of presenting the project to the IRB, helped to validate not only the appropriate nature of the interviews, but also the final narrative and results derived from the project. A second data coder was used to prevent research bias and substantiate the reliability of research findings. The second coder used in this project was also an Extension agent with a production agriculture background. Though background knowledge of beef production is not a necessary characteristic or requirement of a research data coder, it did help in this specific case as it relates to deciphering slang terminology and the specific industry concepts that were mentioned by participants during the interview process. Those industry specific concepts and terms may have been hard to recognize, and ultimately decipher for coding, by an individual with no experience in a beef production or agriculture setting. I kept personal reflections and notes during the interview process with the hopes of eventually providing triangulation in research findings. This remains underdeveloped.
This project was carried out by a singular researcher, myself, ensuring that the researcher’s approach remained consistent. The IRB was utilized to review interview questions and protocol. It is assumed that I, as the researcher, would be spending prolonged time in the field to complete the project, as is the nature of an Extension agent job. This ultimately helped facilitate the final completion of this project and assisted with the ease in which interview participants were enlisted to reach saturation of responses.

Summary of Outcomes, Discussions, and Recommendations

a. Project Outcomes and Results

Interview participants for this study, selected by the convenience sampling method, were solicited for participation over a month-long time period, beginning on August 25, 2022 and concluding on September 25, 2022. Six, of the eventual 10 total project participants, were selected for interview and consented to participation in the project through either close proximity or an interaction with myself during the August/September time period. The close proximity or interactions, that led to the eventual consent and participation in the study of these particular individuals, came by either the participant’s unsolicited stopping by the Extension office, face-to-face contact with me at an Extension or agriculture-related event, or a phone call to the Extension office during the designated enrolment time period. The other four participants, eventually included in the project, were selected at random through an existing office contact database. This project utilized specifically the membership list for the Central Virginia Cattlemen’s Association (CVCA). This membership list has historically been maintained by the Extension office in Orange, Virginia; with an assumed involvement of beef production in the members named within the list. A randomized sort, in Excel, of the full CVCA association membership was performed in order to yield the names for further potential interview candidates. Six names were highlighted at the top of the Excel spreadsheet upon the completion of the randomized sort, to then yield the maximum (12) individuals that were assumed needed to reach saturation in this particular project. Ultimately, four of the six randomly generated, potential participants, identified through the CVCA membership list, were included in the project results. Ten total individuals were interviewed to reach saturation in this project. Saturation in this project was assumed when new categories, explanations, and themes
stopped emerging throughout the interview process. The results of this project were diverse, lists of producer goals and operational limitations, relatively long. This may cause some pause or discussion as to the subjectivity surrounding the matter of saturation; dependent on the interviewer and those individuals coding the research.

Interviews were scheduled and took place spanning the dates of September 26, 2022 to October 13, 2022. All potential project participants that were identified through the convivence sampling method, regardless of if they were identified through the month-long close proximity and interaction period, or generated through the randomized CVCA membership sort, agreed to participation and ultimately consented to the interview process. The ultimate willingness of an individual to participate was investigated by myself, either through an in-person interaction or over the phone. The majority of scheduling a final interview time with participants took place outside of traditional, 8:00 am to 5:00 pm, office hours; with several interviews being conducted outside of traditional, office hours as well. This was an important requirement of me, as the primary investigator, to be flexible and available for communication both before and after traditional office hours. Farming, farm work, and the labor requirements that go along with it are both dependent and contingent on a multitude of outside factors. This makes planning and scheduling for many agriculture producers a hard task. Several interviews in this project were scheduled and rescheduled multiple times due to on-farm emergencies, changes in the weather, etc. It was important that I made myself available either when the daily work was complete or before the workday started; pre-sunrise and post-sunset. My ability to do this helped to ensure participation of individuals in the study that otherwise would have been limited or excluded from the project altogether. The majority of interview participants, included in this particular study, chose for the interview to take place in-person (six); with no project participants choosing the Zoom option for an interview.

In order to best decrease and avoid selection bias and frame the research results, this study relied upon the collection of demographic data at the beginning of each interview that was eventually included in the outcomes and results of the project. I collected and transcribed demographic information (age, gender, race, size of operation, current employment status, and membership status to cattlemen’s groups) upon the conclusion of each interview for this particular study. This study relied heavily upon utilizing a sample size that was large enough to reach the occurrence of saturation in interview responses; thus, best ensuring the absence of bias in
the dictated parameters of the study. Ten interviews were completed before full saturation was reached in this project; with indicators of saturation beginning to appear around interviews seven and eight.

Demographic Information

Demographic variability, though subjective in nature and not compared to a defined, total sample population in this project model, was visible in areas within the convivence sample that I utilized in the completion of the project. Ages of participants in the study ranged from 28 to 80 years of age. Three of the ten total interviewees were females. Full-time, part-time, and full-time producers that were part-time at some point in their beef production career were all represented within the sample. Producers interviewed in this project ranged from having between 30 and 1,000 head of brood cows in their respective operations.

Though not identified in the strictly demographic related questions included in the interview protocol (Appendix), but rather mined from participant responses to the opening and content questions within the interview, the convenience sample also included subjective variance as it relates to retired versus currently employed, first generation versus multigenerational farming situations, personally owned versus leased ground operational structure, and cattle only versus diversified farming operations. Variance was further noted in terms of the types of operations represented in the results of this project; including purebred, commercial, cow-calf, backgrounding, fed cattle, and multifaceted operations. Individuals that were in situations where farm transition could be considered were represented, along with producers who had no children or direct heirs to their farming operations. There was no noted variance in race on the project participants interviewed in this study; with all interviewees identifying as white. The majority of study participants, minus one individual, also identified as members of the Central Virginia Cattlemen’s Association.

When asked about previous interactions with Virginia Cooperative Extension (VCE) participants characterized this in a multitude of ways; with only one interviewee noting limited previous interactions with VCE. Three of the ten participants in the project were previously employed by VCE, with two of those three individuals working for less than one year. Figure 1, below, recounts how participants characterized their previous interactions with VCE, along with noting the number of times that identified themes or characterizations were recorded throughout the interview process.
Producer Operational Goals

Throughout the interview process, participants in the study were asked to identify their personal operational goals. The goals identified, along with the number of times that they were mentioned by project participants, is included in Figure 2.
The most commonly identified operational goal was to raise better cattle and to increase the quality of the product that producers were ultimately supplying to the food chain and other beef producers. Figure 3 includes several important quotes that were mined from the project work as it relates to the most commonly identified producer goal of raising better cattle.

Figure 3. Quotes Supporting Operational Goal of Raising Better Cattle/Increase Quality

*The simplest goals are just to improve on basic production standards, weaning percentage, conception percentage; things like that. Which, you know, has been a challenge. A lot of the cattle that I have were managed by my father and became mine, and so a lot of those things (production performance and quality) were not issues or paid much attention to until I took over and started concentrating more on reproductive efficiency, for example. So, the short-term goals are to make improvements in those areas that a commercial herd should be strong in.*

*Other than selling high dollar, selling high quality. I guess that’s it. Selling better quality and trying to increase the quality.*

*My goal is to get to about 200 brood cows and be able to start working on less quantity and more quality in that 200 head cow herd.*

*To raise the best Simmental cattle I can possibly raise. Sometimes with no regard for the excess price (in striving to accomplish that goal).*

*I would say for all of the 200 momma cows that we have, for every calf to wean off at 50% of their momma’s weight or better.*

*I think I am right where I need to be numbers wise (size of the operation). Productive wise (productivity measures), it can always get better.*
Farming lifestyle continuation and sustainability of the operation were the second most commonly identified producer goals in this project. The quotes found in Figure 4 supplement the identification of farming lifestyle continuation as a significant operational goal in this study. Figure 5 contains the quotes that were mined from the project surrounding the operational goal of sustainability.

**Figure 4. Quotes Supporting Operational Goal of Farming Lifestyle Continuation**

<table>
<thead>
<tr>
<th>Identified Goal</th>
<th>Supporting Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>I said to my husband, “Are we going to sell (the farm and cattle) if we aren’t (moving forward and making a profit)?”</td>
<td>He said “no”. So, there you go. It’s a lifestyle. It’s what we do.</td>
</tr>
<tr>
<td>I sold some cull cows and I am raising some heifers trying to get my numbers back up. Somebody said what do you want to do that at your age? Aren’t you ready to give it up? I am saying, no, I will never give it up as long as I can walk and talk. I have had two knee replacements, well each knee has been replaced, so I can continue working the farm and keeping the land going. I like it to look pretty and look nice for the community. I have had some people ride by that knew me when I was growing up and said they knew my father. (Those people) said to me that my father would look back on this and be proud because I have worked hard to keep it looking good.</td>
<td>I didn’t want to get rid of my cows and I also wanted to keep the farm going in remembrance of him (my father) because my mother and father cleared this land. You are looking at that point in time at just under 200 acres and they cleared it, you might as well say, by hand. They cut the trees. He did it by hand, held a saw, and hauled the pulpwood and stuff himself to the lumber yards. We are doing this for our future generations and it is a lifestyle choice.</td>
</tr>
</tbody>
</table>

**Figure 5. Quotes Supporting Operational Goal of Sustainability**

<table>
<thead>
<tr>
<th>Identified Goal</th>
<th>Supporting Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>All the profit goes back into the farm. We are working every day to sustain the farm for my children and grandchildren.</td>
<td></td>
</tr>
<tr>
<td>The goals would be for my sons to have the option to come back and make the farm to legitimately cash flow and self-sustain for both of them. To be able to do that we started expanding a couple years ago.</td>
<td></td>
</tr>
<tr>
<td>My goal is to just to be able to keep it going; that is the main thing, for as long as I can. (I will do that) until my health (fails), and the day that I have to sell all of it I might not can deal with that (said crying).</td>
<td></td>
</tr>
</tbody>
</table>

Goals that were mentioned more than once by participants include expanding the operation, improving/maintaining the land, increasing profit, and transition to future generations. Breakeven, displacing off-farm income opportunity cost, diversifying current marketing practice, diversifying the operation, growing the existing customer base, increasing the return on investment, operating efficiently, supplying a retirement income, and utilizing land not suitable for row crop production were all goals that were identified by participants one time throughout the study. Figure 6 includes noteworthy quotes that were collected in support of those aforementioned producer goals.

**Figure 6. Quotes Supporting Less Frequently Identified Operational Goals**

<table>
<thead>
<tr>
<th>Identified Goal</th>
<th>Supporting Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breakeven</td>
<td>My great aspiration is to breakeven (said laughing).</td>
</tr>
<tr>
<td>Displace Off-Farm Income</td>
<td>To earn enough profit (from the farming operation) that can be enough</td>
</tr>
<tr>
<td>Table Title</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Opportunity Cost</td>
<td>income for my husband, because we take no money other than that.</td>
</tr>
<tr>
<td>Diversify Current Marketing Practice</td>
<td>So, personal goals, we eventually want to get to the point where we are doing finished beef. Not being price takers, but more so price setters (is our goal). That is not doing retail cuts, but simply selling the half-beef on hoof; we definitely have a market in that and there is definitely a demand for it. The prices that they (the producers marketing cattle directly to the consumer) are getting for fat steers is way better than $1.20 per pound (current market commodity price).</td>
</tr>
<tr>
<td>Diversify Operation</td>
<td>We are also in the process, the early phases, of getting permits to build two turkey houses.</td>
</tr>
<tr>
<td>Improve/Maintain the Land</td>
<td>I’d like to leave the farm better than I found it. Not so much the buildings but just the land.</td>
</tr>
<tr>
<td>Increase Profit</td>
<td>I want it to be as profitable as possible, at least for the foreseeable 5 to 10 years. I have 6 years left in my current lease; so, I at least need to be as profitable as possible and grow that profitability for those 6 years.</td>
</tr>
<tr>
<td>Operate Efficiently</td>
<td>The ultimate goal is to be as profitable as I can be and as efficient as I can be. I am as much about being efficient as anybody can be. If I can make it more profitable by being more efficient that’s what I am going to do. I work at that every day.</td>
</tr>
<tr>
<td>Supply a Retirement Income</td>
<td>In the long-term it is (for the operation) to supply a retirement income. I want it to be as profitable as possible, at least for the foreseeable 5 to 10 years.</td>
</tr>
<tr>
<td>Utilize Land Not Suitable for Row Crop Production</td>
<td>The cattle are really more, I mean I do enjoy cows, but they are more of a fill-in for what we can’t crop and crops that don’t go well and trying to utilize everything that we have to the most efficient level. So, you know, we’ve got some ground that just can’t be cropped, you know, we make a lot of horse hay but there is a lot of hay that gets rained on or gets weeds in it and you can’t feed it to horses; so, we end up throwing that to the cattle and keeping the cows fed throughout the winter.</td>
</tr>
</tbody>
</table>

**Producer Production Limitations**

Project participants were also asked to identify the limitations that were preventing them from reaching their operational goals. The number of operational limitations identified through this project outnumbered the producer goals that were identified. The specific limitations identified by the beef producers participating in the study, along with the number of times they were mentioned are contained in Figure 7, found below.
The most common operational limitation identified by participants in this project was land; more specifically, the initial cost of land, the challenges in renting land, and the importance that access to land plays in meeting operational goals and overcoming other operational limitations. Land was identified as a limitation by more than half of the participants in the study. Figure 8 includes several important quotes that were mined from the project work as it relates to the most commonly identified producer limitation of land.

**Figure 8. Quotes Supporting Production Limitation of Land**

- *Land is primarily our limiting factor because we don’t own any of it. We lease 3,500 acres and that has a big effect. We work around the traditional limiting factors like capital, labor, facilities, but the land; the risk of losing leased land and the challenges with acquiring more land are our primary limiting factors (in achieving our operational goals).*

- *With the price of land, you can’t pay the cost of land (through traditional beef production margins) needed to increase the scale of production.*

- *Definitely labor and land. Even with expensive inputs, you can pencil those out and I can still figure out what the breakeven is and where you need to be at and make that side of it work. You can get it done. At a certain rate you start to not have that type of control; one of my biggest things is landlord relationships and you know trying to keep a good public face.*

- *One is land cost, because we would love to, you know, be able to put more cattle infrastructure in, but the cost to buy the land; especially with out-of-towners, and people who have money from town, or inherited money, or are part of a big estate, they can afford to pay the bigger prices (for land) and don’t necessarily need to make the mortgage payments cashflow. Where with us, yes, we were both in 4-H and had cattle on our property*
before becoming farmers; but in reality, we are first generation farmers. So, we are kind of just starting out (and have to make mortgage payments cashflow). You know my dad had five cows; so, he was just a hobby farmer at best. My husband’s parents didn’t have any cattle. So, we are definitely first generation. So, starting up with expenses and costs there.

I guess the biggest thing is that it is harder and harder for smaller operations to continue to grow. Not even to grow big, but just a little bit. Land is hard to come by; they aren’t making any more. The bigger operations are gathering it up trying to meet their costs. That is probably the biggest thing that I personally am going to face and I think all of the smaller operations are going to face. The smaller operations may get pushed out, not purposely, but the bigger operations are going to need to expand to continue to cover their costs (of operation and production).

Land is getting so hard to get your hands on and it is so competitive to rent land now days. Used to be you wouldn’t have to worry about that; you had land and you were going to keep it, but now; especially with grain prices (being high) you have neighbors coming in and trying to get a lease out from under you. There are more competing factors which make it hard to exactly say how it is going to look. We have one rental property right now that we had since before my husband and I were married; so, for 40 years. It just sold. But we did just talk to the man that bought it and he wants to keep it the same. But cases like that could go the other way (and it be very detrimental to our operation and not conducive to our goal of operational growth).

All of our cattle ground is rented. We own 100 acres where the turkey barns are and we are getting ready to build a third. We are planning to put our house there which will hopefully be done next summer. We run over around 1,300 acres; so, 1,200 is rented (acreage). We are dealing with generational turnover there (in the ownership on rental properties). One of our landlords on one of the properties just passed away; thankfully her kids are easy to deal with.

Available labor was the second most commonly identified limitation found in this project. Figure 9 presents noteworthy quotes that were provided by participants as it relates to the current challenges associated with available labor.

**Figure 9. Quotes Supporting Production Limitation of Available Labor**

**Labor.** The lack of. The lack of people wanting to work and people wanting to work for less than they can get paid elsewhere.

And I mean labor, we were lucky enough that my cousin needed a summer job and so that has turned into a work study at school, but he is a Senior this year so we don’t know what he is going to do next year. He was pretty much the first one that we could find that wasn’t 70 (years old). I mean my granddad helped us out, but to be honest, he didn’t move as fast as he once did in his day (said laughing). We were paying him hourly; so, we were getting the short (end of the) deal but at least he was there and could help us.

Nobody wants to come out on the farm and help. They want to sit in front of the computer or television, feet propped up, and don’t want to work period or don’t know how to do it.

When you try to hire labor and you need them to do things and then they make you look bad, that hurts your operation because they didn’t do things how you would do them. So, you know, that’s something we spent a lot of years saying let’s get bigger equipment and do it ourselves and not have to hire anybody. Well now that’s great, but the equipment is so big that you can’t just have anybody (operate it). It’s not a 10-foot bush hog any more or it’s not an old Rolabar® rake. It’s a 30-foot rotary rake and a 90-foot sprayer, and you know just the liability of just trying to teach people to run those things is big (in terms of limitation).

The limitations add up though. There is a labor limitation. I have got to do everything by myself. If I add labor into the equation my profitability is gone.
Current economic climate, government regulations, input costs, and negative attitudes of the public towards traditional, production agriculture were all identified, by three separate interviewees each, as limitations preventing current beef producers from reaching their operational goals. Figure 10 includes supporting quotes on the limitation of the current economic climate. Figure 11 presents quotes on the increasing limitation found in government regulation. Figure 12 will depict participant quotes on rising input costs, and Figure 13 illustrates those quotes that were mined from the project in relation to negative attitudes of the public towards production agriculture.

**Figure 10. Quotes Supporting Production Limitation of Current Economic Climate.**

| The challenges now, (high) interest rates as I look at expansion (of the existing operation). |
| You look at the dairy industry and most of those dairy’s that stuck around they couldn’t keep up with it. They couldn’t keep up with the equipment (upgrades and needs) and they lived off of the equity of the farm. They were not able to invest and they pushed it to the point that they didn’t have any choice but to get out. I think that we are seeing that in the beef industry, and a couple of others too, that people are keeping on and not replacing anything. It eventually gets to the point that you don’t have any choice but to get out; you can’t keep up. That is the challenge of it. You have to keep on top of it and see how you can adapt to and keep up without just living off of the equity of everything that you have. |
| A perfect competition scenario is when you have a large number of undifferentiated sellers and buyers. There are just a few buyers and we (the producer) can’t afford to hold our product back. They (the buyer) can say yay or nay. |
| I guess the economy is what limits everybody. |

**Figure 11. Quotes Supporting Production Limitation of Government Regulations**

| Take the SEC (U.S. Securities and Exchange Commission) regulation that was currently proposed; if we have to count carbon and trace it all the way back to the cow-calf producer, there are not the tools or the knowledge to count the carbon (within that sector of the beef industry). Everything that I have looked at currently is geared towards grain producers in terms of sequestering carbon. How is a cow-calf guy going to manage that, or count that (carbon), and eventually show carbon credit for that? |
| It (the market) is set up when you have a few large buyers; even if they don’t conspire they wink and nod, they push for government regulation because they are big enough to get through it. When I was in my 20’s there were 30 to 40 U.S. automotive manufacturers; then the government got involved with safety regulations. That took care of knocking out the little guys. They big boys go for the regulations that they can handle and they squeeze their opposition out. I can give you an example of just how snide it can all be. A long time ago there was an organic food producer called Walnut Acres and it was in Pennsylvania somewhere. They had peanut butter that was made from 100% peanuts. The government comes to see them, Department of Agriculture, is this your product? Yes. Well it says “peanut butter” (on the label). Our regulations say that peanut butter must contain no less than 80% and no more than 95% peanuts. You can’t call it peanut butter if it has more than 95% peanuts. The big boys knew what they were doing, and could squeeze a small competitor out. ” |
| I think that if we aren’t careful with all of the labeling, natural, and no hormones, I think that we are going to get our hands tied very fast by not being able to manage healthy animals. I think that that could really make some things change in the future. |
| I have already been told through my veterinarian that some of the drugs that we use to vaccinate these cattle with, you have got to have prescriptions. Even right down to penicillin, a bottle of penicillin, you have to have a prescription. |
Basically, everything that you have to do, and the three-year upkeep that you have to do in nutrient management plans (NMPs), and Virginia Pollution Abatement (VPA) Permits.

**Figure 12. Quotes Supporting Production Limitation of Input Costs**

*Every ingredient, the cost of fuel, everything (that it takes to run a farming operation has gone up in price); nothing is going to go back to what it was before. Yes, our value of what we are selling has increased, but it has not kept up with the (rising) cost of the inputs. Some people are probably getting further behind or they are living on the equity of their equipment and so forth and you can’t do that. I know that a lot of people have cut back on their fertilizer and so forth, and you can’t do that either.*

*The cost of all of these things hasn’t really caught up with people yet. Just the increase of cost, machinery typically goes up 8% per year; we have inflation at 8% now, but this has been going on for a good while. This past year it went up even more than 8%.*

*You do wonder sometimes, are you always going to be able to keep in front of it with the way that the costs (inputs) have gone up if we don’t see dramatic increases in revenue?*

*So, I was buying cattle panels which I was paying like $18 per cattle panel. You go and try and buy one now; you are looking at $55 for a cattle panel. That doesn’t even count for what a spool of barbed wire or (fencing) staples cost and you need somebody to go out and help you do it.*

**Figure 13. Quotes Supporting Production Limitation of Negative Attitudes of Public Towards Traditional, Production Agriculture**

*Well I think the land is a big one, but what goes with that is the concern of the number of houses and urban sprawl and the (negative) attitudes of people (towards agriculture), and the amount of traffic and all of that is just a challenge. It is amazing how much it has changed in the last 5 to 10 years even. It is very visible, and that is going to have consequences.*

*We have seen this more on the turkey side because I think a lot of the cattle places just fly under the radar. On the turkey side, we had people, who have since passed away, go to (Washington) DC and complain about our operation. Saying it was going to use too much water; which he actually pulled a paper on toms (production life water intake) and not hens to come up with the data he presented. That it was going to smell horrible. That it was going to bring the surrounding real estate values down.*

*We have other farms that the owner is amazing to deal with; then the kids are like, we don’t want cows. Cows are bad, they compact the soil; so, we are a little worried about that place. We might lose that if something, or rather when something, happens to that landowner.*

Limitations that were mentioned more than once by participants include fencing, limited marketing infrastructure/options, limited opportunity for expansion, limited supply infrastructure, limited time left in production, and things that are out of the producer’s ability to control. Balancing farm and family life, capital, facilities, health insurance costs, increased road traffic, limited agricultural lawyer availability, narrow profit margins, physical energy, tax/accounting knowledge, taxes, and urban sprawl were all limitations that were identified by participants one time throughout the study. The following figure, Figure 14, presents those noteworthy quotes that were collected in support of less frequently identified producer limitations.

**Figure 14. Quotes Supporting Less Frequently Identified Production Limitations**

<table>
<thead>
<tr>
<th>Identified Limitation</th>
<th>Supporting Quote</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balancing Farm and Family</td>
<td>Mainly what is driving that (goal and idea), is quality of life, and kids, and</td>
</tr>
<tr>
<td>Life</td>
<td>the fact that right now we are running in so many different directions. We are wearing so many different hats that we don’t have the family time, per say.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Fencing</td>
<td>The simplest thing that limits what I can do is how much fence I have. Start at the simplest point. I can’t make but so much improvement in certain areas without having the fencing that I need to be able to control the animals that I have. That doesn’t seem like a lot at first when you talk about it, but when you get on the ground and look at what you want to do and how you would do it; the fence is where it starts.</td>
</tr>
<tr>
<td>Health Insurance Costs</td>
<td>Taxes and insurance are definitely limiting factors. Insurance is soon going to be $650/ month out of my pocket and that adds up. That’s a big deal at the end of the year.</td>
</tr>
<tr>
<td>Limited Agricultural Lawyer Availability</td>
<td>You know the fact that we went to school for ag, and I went to school further for animal husbandry and animal health; nobody ever taught me how to be a lawyer. So, you have to wear these different hats or you have to add that extra expense and find an attorney that actually knows something about farming, which is few and far between. I love our attorney, don’t get me wrong, and he is a country boy, but he is not a farmer.</td>
</tr>
<tr>
<td>Limited Supply Infrastructure</td>
<td>Take for example, you know, 20 to 30 years ago the number of tractor dealerships around (today it is substantially less). Look at the consolidation with that. We are going to see that through (sourcing) your feed, fertilizer, marketing, all of that. I think you are going to see a significant consolidation over the next 10 years. The infrastructure of everything has gotten age and hasn’t been kept up due to the expense.</td>
</tr>
<tr>
<td>Physical Energy</td>
<td>Time and energy. I am a one-man operation.</td>
</tr>
<tr>
<td>Tax/Accounting Knowledge</td>
<td>You know, trying to figure out and sort through all of the tax breaks, and not have to depreciate everything away within the first couple of years to be able to not have to pay an arm and a leg in taxes. Really, we would like to reinvest that money and keep growing the farm so that it can sustain us, but Uncle Sam, you know, if you show a profit he is going to take a third. That makes it really hard to keep growing. So, yeah, trying to find an accountant that projects it forward. We had an accountant doing our taxes, and I absolutely loved her doing our taxes, and she could at least, from them having the farm, and she knowing about it, could help me try and figure things out. However, she always did it from the standpoint of, alright, let’s not have to pay in and depreciated everything out as we bought it. Well that is fine and dandy, except now we have to keep buying stuff. We have kind of met our equipment max, but I would love to be able to pay down mortgage debt and things like that faster and not just having to buy equipment each year.</td>
</tr>
</tbody>
</table>

Further Collected Data Driven at Establishing Cooperative Extension’s Ability to Better Address Producer Goals and Operational Limitations

To support the determination of if any opportunity exists for Cooperative Extension to better address or incorporate producer goals and operational limitation into future education, participants were asked questions centered around the identification of what educational resources they frequent most often, why they may
frequent this source most often, and if there were any beef related topics or questions that they have tried to find a resource for and not been able to do so.

Seven of the ten participants in this project stated that there were not any beef related topics or questions that they have tried to find a resource for and not been able to do so. Two participants mentioned Theileria, and other beef production related diseases (though those diseases were not specifically named by participants) as examples of beef related topics or questions that they would like to be able to have more resources available on. Participants cited the newness of Theileria and the current, ongoing research aimed at answering further questions as the reason for the limited amount of data and information available to them currently. Two participants mentioned that they faced challenges in adapting out-of-Region based research to ultimately make it applicable to their specific operations and situations in the focused upon Central Virginia production area. Those two participants cited that they believe the answers to all of their questions were in existence, but that adaptation may have to be applied to information to make it applicable and pertinent to their particular production situations. One participant mentioned that they have historically had a hard time finding answers to USDA FSA beef related, available programs.

Project participants identified the educational resources found in Figure 15 as the resources they frequent most often. In Figure 15 you will not only find the names of those educational resources, but also a count of the number of participants that identified the source throughout the interview process conducted in this project.
The most commonly identified educational resource in this project was Cooperative Extension services. Extension agents, Extension specialists, and the system as a whole were included and identified by half of all project participants. Four participants indicated that the educational resource they frequent most often is in-person educational programming. For-profit sales representatives and veterinarians were each mentioned three times. Agronomists, the internet, Natural Resources Conservation Service (NRCS), other producers, and University-based Publications/research studies were each mentioned by two participants. Nutritionists, professional colleagues, and the USDA Farm Service Agency (FSA) were identified one time each throughout the interview process. Figure 16 includes several important, supporting quotes that recap well the sentiment of project participants as it relates to the most frequently used educational resources.

Figure 16. Quotes Supporting Most Frequently Used Educational Resources

*I would probably say my biggest knowledge base, most of the time, are the people in our industry. The people that have been doing it longer than I have. My veterinarians, my nutritionist, people with Extension and NRCS on pasture management and different ideas, the agronomists. You know people that know and understand trying to get the most amount of production that we can. People that understand farming in a frame with the least amount of inputs and trying to do it as efficiently as we can.*
Other beef producers. You know you ask your neighbor that. Vet, for health. Extension. I would say my best (educational resource) is my neighbors and other farms. You can ask someone if they have had a certain problem before and how they have dealt with whatever the issue is.

There are really a lot of opportunities. You all (Extension) have put on ones (educational meetings), Purina, NRCS, Forage and Grasslands Council. I have gotten so much help from specialists (working for non-profit, governmental organizations). As a lawyer, I spent most of my time defending my clients from the government (said laughing), but in the agricultural area it is absolutely fascinating because there is such a close relationship between all of these helpful government entities. There is no differentiation between State and local territory. It all really works together. NRCS, Extension agents, the Soil and Water Board; the farmer doesn’t know who he is dealing with, and doesn’t need to. They are all working together. It is the best place that I have seen government operate. I think that stems from the local aspect, there seems to be no aspiration to go to the next step up and it is focused.

Well I guess the specialization of individuals; whether it is a field rep, an agronomy rep, a veterinarian. I would say I use them. Extension in some cases. Then what you actually read and so forth. Obviously, the internet is a source that if you know what you are looking at you can find information also.

To be honest, Google is as helpful as anything. If something comes up; there’s a problem, I just start searching for answers to see what I can find. If it is a University website, an Extension website, I will go to those first and I will try to look at numerous websites. Just like anybody, if it comes up in the first page or two of a Google search; if it is doing what I want to find out or am interested in, that is what I will look for.

Extension agents, and educational programs. We have a lot of historical knowledge and hands-on production knowledge but we really took advantage of those things earlier on in our production careers. But even today, we go to NCBA (Cattle Industry Convention and National Cattlemen’s Beef Association Trade Show), we have been through Cattlemen’s College before; just a lot of programs.

When project participants were asked why they think that they frequent the educational resources that they identified most often; they cited the following reasons, at the identified rates (refer to Figure 17):
Figure 17. Producer Identified Reasons for Frequenting an Educational Resource.

The most commonly identified reasons for frequenting an educational resource most often was the source being knowledgeable and specialized. The participants cited resources being personal/people based as the reason for them frequenting it most often three times throughout the study. Sources being easy, experienced, highly qualified, getting an immediate response or quick, readily available, and up-to-date were mentioned by two participants each. Participants identified, one time each, that they frequented a source most often because it was adaptive to their needs, provided socialization, the resource was well connected, and well documented.

Figure 18 includes several important, supporting quotes that recap project participant’s responses as to why they frequent educational resources most often.

Figure 18. Quotes Supporting Reasons Why Educational Resources are Frequented Most Often

**They are readily available and very knowledgeable. We also look to these sources to help us keep on top of things that are always changing; something that we don’t always have the time to keep up on. As our needs have changed, these sources have been able to keep up with our changing needs.**

**Well I like to see people and to know who I am speaking to, for one. Then if it is something (that is specialized) you can’t keep up with everything. For example, corn hybrids. I depend on, and instead of trying to research and so forth, people that are in that field and fool with it every day. Veterinarians obviously, if it gets something**
that we can’t handle, depending on the veterinarian, they come in and work with you.

It’s quick and easy. I get an immediate response. It’s easy. It’s easier than calling my Extension agent. Not that I don’t pick your (the Extension agent’s) brain if I need to, but I can go right to the computer and find out something quickly.

Because, you know, books and educated people do not experience the day-to-day and that (first-hand experience) is where the knowledge is and comes from. The hands on, what works, what doesn’t work, there are things that may work in our area that doesn’t work in other areas; the people that are doing it are the people that know.

I have been accused by (said laughing), and I will share this and you will laugh too, but I have been accused of going to them (producer meetings) because I like to get food. Well, I told them the other day, what you don’t realize is that you stay on the farm and you work 24-7. You don’t always get out there to visit with other farmers, see what their ideas are, see what the practices they have got going (are). It gives you the opportunity to see people and to visit with other farmers that you may not have seen for a year, or you may not have seen for five years. You are socializing, and sharing ideas, and you may come up with a better idea than what you have got going.

Number one, the availability of programs to me. Extension programs and generally their research is well documented and their researchers and staff are highly qualified.

Well they should be the most educated about it. The most familiar with the numbers. I find the specialist in whatever area it is that I have a question about; that’s what they get paid for.

b. Project Outcomes and Results Analysis

The ultimate goal of this project work was not to add, detract, or contemporize past studies or current knowledge surrounding the identification of beef producer production goals, and the limitations that producers face in meeting those identified goals. Many historical studies have taken place in order to accomplish the aforementioned. Instead, it was designed to create a replicable methodology and needs assessment approach that could be utilized by Extension agents, regardless of years-of-service or experience level, to identify producer goals and limitations within the specific clientele that they serve. This study, through the identification of producer generated goals and limitations, provided me with the baseline information necessary to create impactful educational programming moving forward. The study provided a working, necessary tool and methodology needed to remove assumption, sometimes felt required, on the part of Extension agent’s and Extension programs in the quest of meeting community need. The project ultimately provided tangible, qualitative, direct quotes surrounding beef production mined from my specific locality or area of Extension service. The project gathered qualitative data, straight from the producer's mouth, that can be used to design, revisit, revamp, add to, or validate existing Extension educational program design.

Upon the analysis of producer reported production goals and limitations, supplemented and expanded with the analysis of further reported producer information collected throughout the interview process, patterns
can eventually be deduced by the Extension educator. Primary areas of educational focus may develop over time through the further analysis of data collected through this project’s methodology. Existing educational programming may have the ability to be adapted and evolved to meet the current producer needs identified within this project work. Long term impact statements may begin to develop, utilizing the qualitative information collected in this project. These developments should all contribute positively to increased programmatic buy-in, and increased educational uptake. The qualitative information collected through this study should ultimately provide me with the objective, non-assumptive most limiting factors to production that are necessary in order to develop further programmatic focus. This information, in turn, will be used to develop or further develop and create long term impact focus for the Extension agent overseeing the program. This project has the potential to eventually positively impact the continued securing of funding to the local Extension program that the project was employed in. This statement is based upon the assumed ability of a needs assessment, focused on the identification of goals and limitations, having the potential to positively affect the development of programmatic impact statements shared with program stakeholders. This is believed to have been accomplished through this project work.

c. Implications, Impacts, and Recommendations

In order for Cooperative Extension to continue to successfully meet the educational needs of the communities it serves; the organization must continue to successfully identify the needs of their contemporary clientele. Past the identification of those needs, Extension must continue to successfully use needs-based assessments to design pertinent and applicable educational programming based around meeting those identified needs. As an organization that is dependent on stakeholder support and community buy-in for survival, this becomes all the more important. This project serves as a model approach for both long-term and newly hired Extension personnel to use in accomplishing needs identification within the communities that they serve. In a contemporary world that continues to become more specialized in terms of the services offered and more technologically advanced, Extension must continue to tailor its offerings in order to remain viable and visible in its mission. The collection of producer production goals and limitations in meeting those goals should only increase Extension’s ability to accomplish this. This study shed light on the importance of a specialized
knowledge holding in both Cooperative Extension professionals and the resources that those in the system develop and provide. Though education, years of service, and Extension or teaching experience all hold significant value as it relates to an Extension professional’s ability to create impact, this study shed light on the importance of Extension professionals holding, or providing, specialized knowledge in an area of educational focus. It also shed light on the value of first-hand production knowledge and experience in the contemporary Extension professional.

Practicing Extension agents will have immediate access to the interview protocol (Appendix) utilized within this study to collect localized data, specific to the area that they serve, should they choose to do so. The project has the ability to cause those participating in the interview process an opportunity to reflect upon their identified goals and limitations. This potentially provides them with the opportunity to begin making daily management decisions focused on helping them in overcoming the limitations that they identified through the interview process and ultimately in achieving their operational goals. The producer limitations identified throughout this project work provided me with the context needed to frame future educational programming and valuable context needed for understanding between myself and both existing and new clientele.

Extension agents that utilize the interview approach developed through this project work may begin to realize the large number of assumptions that they make in the quest of daily service to clients. Without strictly recognizing client identified goals and limitations, Extension agents are shooting blindly in their quest to help both established and potential clientele meet their production goals through education. This project offers a formalized, established way to identify the most limiting factors not only to production but, more importantly, to educational uptake. Should the formalized interview protocol (Appendix) and methodology for analysis of producer interviews developed through this project not be adopted fully, the project should still shed light on the importance and security offered in surely identifying producer goals and limitations within the Extension profession. This project showed signs of significant value as a stand-alone relationship building tool for the Extension professional, should it be chosen to be used in this manner, with no mind paid in reaching saturation to serve as a needs assessment approach.
It serves as a recommendation that this project has the potential be adapted to the specific needs of Extension professionals in any geographical area, educating in any programming area, as long as it holds true to the approach of identifying goals and limitations in the process. Extension Leadership Council members could be used as primary investigators, if provided with the interview protocol. This arrangement would serve to decrease even further the personal resources that Extension professionals have to dedicate to the needs assessment process. This may also serve to further leverage and expand the potential that this approach presents in programmatic development.

Future projects, developing based upon the work done throughout this project, have the opportunity to investigate the potential relationship strengthening and building that took place, between the primary investigator and interviewees, throughout the project work. Undertaking the formalized needs assessment methodology, and the further utilization of the interview protocol (Appendix) developed though this project, presented the opportunity for the development of future meaningful relationships between the Extension agent and the clientele that participated. These phenomena were informally identified through this project, but it was not an area of focus that was formally investigated or reported on. The project could also spur the investigation of potential behavior change brought about solely based upon the producer going through the process of identifying and verbalizing production goals and the limitations facing them in meeting those goals to the primary investigator in this project. Future projects have the opportunity to address the methodology limitation of the primary investigator not having access to historical producer contact lists in order to recruit enough project participants to reach saturation in their particular situation. They will also have the opportunity to revise and add upon the demographic information collected throughout the project protocol; potentially adapting it to provide an even higher level of context to producer answers. The fundamental practices presented in this project have the ability to be adapted and analyzed in other traditional Extension programming areas, past the agriculture and natural resources program area focus.

d. Dissemination Plan

The qualitative data recorded through this project work has the ability to supplement the next state-wide beef producer survey in Virginia. The project results, along with the interview protocol tool (Appendix)
developed to complete the project, will be presented to other Virginia Extension agents at the state-wide in-service training scheduled to be held at the beginning of 2023. The results, along with the project methodology have the ability to be adapted into a VCE publication and shared with other working Extension professionals. The project has the potential to be presented in NACA®, The Journal of Campus Activities Practice & Scholarship. Producer quotes and the results that were identified through this study, surrounding current goals and limitations of the beef producer, could be presented to the Virginia Cattle Industry Board to assist them in their mission to serve the Virginia Cattle Industry through opportunities in education, market development, promotion, research, and youth development.

e. **Conclusion**
The project answered each of the following research questions:

1. What are the operational goals of Virginia cow-calf producers?
2. What are the limitations preventing Virginia cow-calf producers from reaching their operational goals?
3. What, if any, opportunity exists for Cooperative Extension to better address or incorporate producer goals and operational limitations into future education?

The operational goals of Virginia cow-calf producers identified through the interview process include the following:

- Raise Better Cattle/Increase Quality
- Farming Lifestyle Continuation
- Sustainability
- Expand Operation
- Improve/Maintain the Land
- Increase Profit
- Transition to Future Generations
- Breakeven
- Displace Off-Farm Income Opportunity Cost
• Diversify Current Marketing Practice
• Diversify Operation
• Grow Customer Base
• Increase Return on Investment
• Operate Efficiently
• Supply a Retirement Income
• Utilize Land Not Suitable for Row Crop Production

The operational goals identified throughout this project work will be used to title and center producer educational programs moving forward. Some of the identified goals in this project have the potential to serve as stand-alone programs, while others present in a manner that is more conducive for multiple programs, or a series of learning events, aimed at addressing the identified goals. Past this, the production goals identified through this project significantly helped me to understand producer motivation as a whole; making me question some of the assumed production goals that I had for the group at the beginning of this project.

Limitations preventing Virginia cow-calf producers from reaching their operational goals include the following:
• Land
• Available Labor
• Current Economic Climate
• Government Regulations
• Input Costs
• Negative Attitudes of Public Towards Traditional, Production Agriculture
• Fencing
• Limited Marketing Infrastructure/Options
• Limited Opportunity for Expansion
• Limited Supply Infrastructure
• Limited Time Left in Production
• Things That Are Out of Producer Ability to Control
• Balancing Farm and Family Life
• Capital
• Facilities
• Health Insurance Costs
• Increased Road Traffic
• Limited Agricultural Lawyer Availability
• Narrow Profit Margins
• Physical Energy
• Tax/Accounting Knowledge
• Taxes
• Urban Sprawl

The production limitations that were identified throughout the project work have the ability to frame the ways in which educational resources and programming are presented moving forward. Many of these limitations could be addressed by simple reform or addition to existing Extension educational program offerings. The limitations that were identified throughout the project work show significant value, in my mind, as it relates to one-on-one client and Extension educator interactions. In knowing an individual producer’s production limitations, I can better consult and assist that beef cattle producer with their specific and individual production settings and operations. The large number and significant variance of production limitations identified throughout this project also sheds light on the fact that we, as contemporary Extension educators, are facing the task of addressing very complex problems and production issues though education in the current climate. It made me more aware of the fact that programming, though obviously not inclusive of addressing each of these limitations at once, needs to exhibit significant variance and attempt at becoming more all-inclusive in terms of assumed skill level of producers, existing knowledge base, and operational level. It also
reveals the need in my opinion to go through a formalized needs assessment approach more often than I historically have leading up to the point of this project.

In the quest of answering the final research question of what, if any, opportunity exists for Cooperative Extension to better address or incorporate producer goals and operational limitations into future education, this project shows that opportunity does exist. I believe that the data collected through this project sheds light on the specific areas of production that concentrated education in could ultimately benefit producers the most. It could also provide the Cooperative Extension system, as a whole, with a roadmap of agriculture production areas that could potentially benefit by the hiring of new, additional specialists with specific knowledge in those identified areas. There appears to be an opportunity for Cooperative Extension to better address and incorporate producer goals and limitations into both future education and existing educational opportunities just by the creation of awareness that this project allowed for. This project work ultimately increased my awareness and understanding of clientele and their current practices and behaviors. The number of producers that identified each identified goal or limitation could be used to set priorities in education, focus, or resource allotment. The potential relationship building piece that this project provided appears that it could have significant value to the Extension system as a whole. Through the completion of this project I have gained access to information that I believe to hold power in increasing program participant buy-in and increased educational uptake. The information collected here holds significant value in terms of shaping my approach to educational topics and providing context that can then be applied to educational programming. Ultimately, I feel that I have taken the first step in being better equipped to design programming that is both applicable and mindful to the producer identified goals and limitations mined in this project.
References


Appendices
Interview Protocol
Operational Goals and Production Limitations of the Beef Producer
Interview Protocol (IRB# 22-230)

Protocol
The interviewer will follow the outlined protocol for each interview conducted. Each interview will include the following segments:

- **Introduction**: to include the introduction of the interviewer, discussion of the purpose of the study, a review of implied consent, a discussion of the general structure of the interview, a definition of any important terms that will be used in the interview, and an opportunity for the interviewee to ask any questions they may have
- **Basic information about the interview**: to include the time and date of interview, location interview took place, the names of both the interviewer and interviewee, and the file name for the digital copy of the audio recording
- **Demographic Questions**: to include demographic questions related to the interviewee and their operation, a review of how demographic data collected will be used to avoid selection bias in the process and nothing more
- **Opening or Icebreaker Questions**: to include soft questions aimed at providing the interviewee with an opportunity to talk about themselves and increase ease
- **Content Questions**: to include the research sub-questions related to the study
- **Closing Instructions**: to include a thank you to the interviewee, an assurance of the confidentiality and use of the interview, offer of interview transcript and abstract of the final study

Introduction
Before we begin, please note that throughout this interview I will be reading from a script to ensure consistency in delivery to all participants. For the further purpose of formality, I will begin this interview by introducing myself. I am Courtney Wesner. I am the Agriculture and Natural Resources Extension Agent in Orange County, Virginia and am currently a student in the Online Masters of Agriculture and Life Sciences Program at Virginia Tech.

The purpose of this study is not only to serve as the subject material for the completion of my final Master’s project, but it will also be used as a tool to support the assessment of local beef producers’ educational needs. Finally, this project will qualitatively support a state-wide Extension effort, as a result of a grant from the Virginia Beef Industry Council, aimed at quantifying current beef producer marketing and selection methods. Your participation in this study will help accomplish this through the identification of your operational goals, and the production limitations that you may face in meeting those goals. This interview will be recorded with a digital recording device; the information that is collected during this interview will then be transcribed and ultimately compiled with the interview data from other participating producers. It will then be evaluated as a whole for key, repeatable themes. The overreaching goal of this work is to assist Extension, the University, and supporting industry partners in best determining future educational focus, research, and resource allocation.

This interview will continue on the grounds of implied consent. Your consent, up to this point, has been implied based upon your willingness to schedule the interview and sit here with me today in order to participate. If at any time during the interview process you wish to discontinue the interview, you will signal that to me. Should you feel that you wish to skip any particular question, that will be granted as well. Please know that your failure to continue with the interview at this point, your wish to discontinue at any time, or your signal to skip any questions, will not have any impact upon your future interactions with me. Do you have any questions about your implied consent to continue this interview at this time? If so, I would be happy to answer those.

57
The interview will follow a short and simple structure. First, I will record some basic information about the interview to include the time, date, location, both of our names, and the file name for the digital copy of the audio recording. This information will only serve to aid in the organization of the data throughout the project. Next, I will ask you a series of demographic questions related to you and your operation; for example, your age, race, gender, etc. This information will be used by myself, as the primary investigator, to assist in the avoidance of selection bias throughout this project. The answers to these questions will in no way impact the validity or perceived importance of the interview. I will then continue into the body of the interview itself. This is a series of five questions. The questions will be centered around aiding a discussion of your personal goals for your operation, the limiting factors that you may face in meeting those personal goals, and your general feelings about raising cattle. Throughout the interview, I may ask you to expand on an answer that you have provided. Remember, this interview is a chance for you to express your personal views and feelings as it relates to your operation. I want to be sure that I understand this to the fullest degree possible and capture it within this space. Again, if at any time you feel uncomfortable in answering a question or should you wish to discontinue the interview please signal this wish to me. Do you have any questions about the general structure of the interview?

Basic Information About the Interview
If it is okay with you, I will begin recording the interview at this time. We will begin by capturing some basic information about the interview.

- This interview is taking place on (insert date) at (insert time)
- The location of the interview is (over the phone, over Zoom, or note in-person location)
- My name is Courtney Wesner, and I will serve as the primary interviewer; the primary interviewee will be (note participants full name)
- The digital copy of the audio recording for this interview will be titled (note file name)

Demographic Questions
Alright, before we move into the body of the interview questions, I will now ask you a short series of demographic questions related to yourself and your operation. Remember, the answers to these questions will in no way impact the validity or perceived importance of the interview. I will only use the answers to these questions to assist me in avoiding selection bias throughout my needs assessment process.

1. What is your age?
2. What is your gender?
3. What is your race?
4. How many head of cattle do you currently run?
5. Are you a full-time or part-time farmer?
6. Are you a member of a Virginia-based cattlemen’s group, such as Virginia Cattlemen’s Association, Central Virginia Cattlemen’s Association, or others?

Opening Question (Icebreaker)
1. How many years have you been raising beef cattle?
2. What do you find most enjoyable about raising cattle?

Content Questions
1. What are your personal goals for your cattle operation?
   a. Ten years from today, how do you think the beef industry as a whole will look?
   b. Ten years from today, how will your operation look?
2. What things, if any, are limiting you or preventing you from achieving your operational goals?
3. What educational resources do you frequent most as it relates to beef production?
   a. Why do you think that you frequent this source most often?
   b. What beef related topics or questions have you tried to find a resource for and not been able to do so?
c. Talk about any previous interaction(s) you may have had with Virginia Cooperative Extension services?

Closing Instructions
This will conclude the interview. Thank you for taking the time out of your busy schedule to sit with me today and share your thoughts and feelings over the topic. I truly appreciate it. Can you think of any further questions or statements as it relates to your operational goals and production limitations that you would like to share with me at this time?

Again, please know that this process will focus on developing key, repeatable themes; without mind or the linkage of your identity in the process. The interview has been recorded and a transcript of our conversation will be prepared within the next two days. I will share the transcript with you electronically at (insert participant email), and at that time you will have a chance to make edits should you desire to do so. Should I not receive any feedback from you within a week of sharing the transcript, I will assume that it reads as you wish. Take care, and again thank you for your participation in this work.